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COAL

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THE practice of our oil-well sinkers in firing a torpedo to start a dry or increase the flow of a sluggish well has been taken advantage of in England successfully in the case of water. At the Herne Bay Water Works, a well bored into the chalk 576 feet deep from the surface yielded little or no water, and upon the advice of Messrs. John Taylor & Sons, who, being mining engineers, doubtless had the Pennsylvania oil practice in mind, two charges of roburite were fired, the first consisting of 27 pounds of the explosive placed at the bottom of the bore hole, and the second of 25 pounds at 50 feet above the former. The second shot had the desired result and produced a volume of water estimated at 50,000 gallons a day, which rose to the top of the well.

THE report of the Commission of Engineers to the liquidator of the Panama Canal threw some light on the true situation as far as the condition of the work done and to be done on the great ditch is concerned, and now we are likely to have another inquiry which promises to be equally interesting and instructive. The unfortunate shareholders in De Lesseps' enterprise have petitioned the French Chamber, praying that the liquidator of the defunct canal company be required to make an exact statement of the expenditure of the money confided to M. DE LESSEPS and his co-directors, showing how much was spent on actual work at the Isthmus, with prices of the respective contracts, and how much was frittered away in secret service, home commissions, press subsidy, etc.

The petition suggests that as the shareholders were practically induced to part with their money upon false representations, the amount of money subscribed being more than double that stated by M. DE LESSEPS to be sufficient for the completion of the work, the government should, through the Minister of Public Justice, recover for the shareholders, as in the case of the Comptoir d'Escompte, an indemnification from the directors of the canal company. The committee to whom the petition was referred has in its turn admitted the principle on which it is based, and has turned it over to the Minister of Justice to take action upon if he approves, so that, judging from the impartial investigation of the courts into both the Comptoir d'Escompte and the Société des Metaux scandals, we may expect a thorough investigation to be made.

THE present prospects of the Silver Bill in Congress are too uncertain to justify any positive assertions. The Senate has modified the bill as it passed the House by striking out its most valuable feature, namely, that giving the Secretary of the Treasury the option, at the request of the holder, of redeeming the certificates in bullion at market price. This would always keep the notes worth their face in gold, even if the government had no gold with which to redeem them, though, of course, when the market price of silver has gone below that at which the Treasury had purchased the bullion, the loss would be made up out of the taxpayers' money.

The Senate Finance Committee has added a clause limiting the time during which the act is to operate to ten years. It would have been better to say three years. There have been other changes, but as "the end is not yet," it is scarcely worth while discussing them. At present the best information we can get in Washington is to the effect that either a free coinage or free bullion bill (which is the same thing) will pass the Senate, and a strong effort will be made to carry it through the House, though the probability is that it will fail there. Should it pass there it will, no doubt, be vetoed by the President, and it therefore seems probable that the present agitation will result in either a simple measure calling for the purchase of 4½ million dollars (or ounces) of silver monthly to be paid for in notes redeemable in lawful money, or a simple instruction to the Secretary of the Treasury to purchase monthly the maximum (4,000,000 dollar worth), allowed under the present law, and to coin the same into standard dollars.

KENTUCKY WILDCATS IN LONDON.

Many investors appear to have the impression that the species "mine wildcat" is confined to gold, silver, copper, or other metal mines, and that investments in coal are always safe and profitable, though the dividends may be slow of realization. This is far from being the truth, as our good cousins, who are now reported to be investing wildly in Kentucky, West Virginia and Tennessee coal lands, are likely to find out. The stocks of some of these companies are said to be now selling at 200 and 300 per cent. premium, though the properties, even if they belonged to the companies, are wholly undeveloped, and are not likely to be productive for many years to come.

There are two or three very serious questions to be considered in some of these investments.

1. Have these companies any good title to the great areas they claim to own, and on which the value of their stock is based?

2. Are the lands actually of good quality as coal property?

3. Are the lands accessible, and can they earn profits in legitimate mining?

1. Unfortunately the titles to many of the large tracts of land in Kentucky, and West Virginia, some of which have been purchased by English companies, are defective beyond possibility of correction, and those who invest in the stocks that represent them will assuredly lose their money. It is by no means sufficient that the paper title to the land should be apparently regular and clear, for there may be several such apparently good paper titles to one piece of land while at the same time the property may be in the actual possession of men whose possessory title is better than any paper title, and who defend their possession with Winchesters. We would advise London investors to act with great circumspection in this matter.

2. It is by no means enough to know that a given property is in a field containing good coal to be assured that the property itself is good coal land. The coal beds of every coal field—and Kentucky and West Virginia form no exception to the rule—are extremely irregular, both in thickness and quality, and the only rational method to follow in purchasing such property is to have each tract of a few hundred or a few thousand acres tested and examined by competent and disinterested experts.

Comparatively little of the field can be considered first-rate coal land, and none of it will come up to the representations made in some of the interested and irresponsible reports which have been made on many of these lands.

3. In a tract of perhaps two, three or five hundred thousand acres, as some of those properties claimed by English companies are supposed to be, there may be but a few per cent. at all accessible to any railroad likely to be built soon. These companies cannot possibly earn dividends on their capital from the coal or timber business for a great many years to come. Most of their lands have been offered here within the past 18 months at from 50 cents to $2.50 an acre, the coal and surface costing but little more than the coal rights alone. Usually $1.00 an acre would cover the difference. Some of the lands in these districts have been purchased here at these figures, and many more, including some of those since sold in London at $15.00 an acre, or more, have been rejected because of bad titles, and in some cases also because of the poor quality or insufficient quantity of the coal.

The great profits to be derived from the magnificent forests which cover the land have always been more prominent in the prospectuses of companies and in experts' reports than in the bank balance of the owners. Though far from being valueless, the earning capacity of these forests is always greatly exaggerated.

In brief, while well-selected large tracts of coal land with good titles, at the low prices of $2.00 to $10.00 an acre, at which they have recently been, and can still be purchased in these States, are undoubtedly safe investments, which in time will become profitable, and choice small tracts are good investments at even considerably higher prices, yet wild investments are as likely to prove unprofitable in that country as elsewhere. The town lot craze, such as that which has produced remarkable returns at Middlesboro, Ky., before any industry has been started, is the most risky and uncertain of foundations for an investment. There is no doubt, however, that this is the basis on which many of the English schemes are based.

ATTENUATED SCIENTIFIC DEDUCTIONS.

There is a certain muttonian fibre running through human nature which often leads us in blind succession over a wall which some leader, bold or reckless, has vaulted. It is not so long ago that it was announced with complete assurance that aluminum lowered the melting point of iron. This was passed from mouth to mouth, the professors taking it up and speaking of the "well known effect of aluminum," and the whole metallurgical world seemed to have swallowed completely, hook and all, this utterly unfounded assertion. One of the first, if not the first, public challenges of it occurred in our columns (October 29th, 1887, p. 314, "Howe's Metallurgy of Steel").

A fresh instance of our muttonicity is afforded by the recent thermo-chemical utterances of certain metallurgical writers. The theorem is announced that "every chemical change effected without the intervention of an extraneous force tends to produce the body or system of bodies that disengages the most heat," to which is usually attached, explicitly or implicitly, the corollary that no chemical reaction can occur which is accompanied by absorption of heat. In other words, in order that a given chemical reaction may occur, the heat which it develops must exceed that which it absorbs. Hence, knowing, as we do, the heat-development caused by the combination of certain elements, the combination of oxygen with carbon, with iron, with hydrogen and what not, it has been attempted lately to predict that certain reactions must and that certain others never can occur, because they obey or oppose that corollary.

Now, such predictions are not only unjustifiable, but absurdly and ridiculously unjustifiable. For either it is true that the heat developed by a given reaction changes very greatly with changing temperatures, pressures, proportions of different substances present and other conditions; or else the above corollary, at least when taken in the present narrow way, is absolutely false and in opposition to a host of perfectly established facts.

Thus, much hydrogen passed over little iron-oxide reduces it completely with the formation of water and metallic iron; but little steam passed over much metallic iron is completely deoxidized, with the formation of hydrogen and iron oxide. Seal in a glass tube iron oxide and carbonic oxide; heat them to 1,000 degrees C.; some of the oxygen leaves the iron and unites with the carbonic oxide, yielding a mixture of carbonic oxide and acid. After a sufficient length of time equilibrium is reached, and all further action ceases. But now raise the temperature still higher, and some of the oxygen returns to the iron; lower it and oxygen returns to the carbonic oxide, the reaction going on in each case until equilibrium is reached. Now, without going into calculations, it is perfectly clear that either the heat developed by the union of oxygen with hydrogen, iron and carbonic oxide has changed with changing temperature and conditions; or else that reactions have here occurred with absorption of heat, for reactions which occur under certain conditions are reversed when these conditions change. If the one cause a net evolution of heat, its reverse must cause a net absorption of heat.

It was long ago pointed out that the phenomena of dissociation resembled those of evaporation. We may go a step farther and say that those of chemical combination resemble those of evaporation. Fill a boiler partly with water, heat it, and evaporation will go on till the quantity of vapor of water contained in each cubic foot of space above the liquid water reaches a certain point, corresponding to equilibrium for existing conditions; then action ceases. But disturb these conditions, and equilibrium is overthrown, evaporation beginning again, or condensation occurring. Raise pressure or lower temperature, and water passes from the gaseous to the liquid state till new equilibrium corresponding to the new conditions is reached; lower pressure or raise temperature and the reverse occurs. Here the passage of water from one condition to the other seems like that of oxygen from combination with iron to combination with carbon and back. So, too, the play of phosphorus back or forth between metal and slag in dephosphorizing processes goes on till equilibrium for the existing conditions (temperature, basicity of slag, composition of metal, etc.), has been reached. Change the conditions, and the action continues or reverses till new equilibrium is reached.

At the Paris Mining and Metallurgical Congress last autumn it was gravely announced as an axiomatic proposition, by one of the secretaries of the congress—a man of great metallurgical fame in France—that aluminum never could be deoxidized by carbon, because the combination of aluminum with oxygen developed more heat than the combination of carbon with oxygen. There was an end on't, and experimenting would, one might infer, be as senseless as the attempts made in South Britain to fire the church furnaces with chalk. The representative of the ENGINEERING AND MINING JOURNAL, alone of that distinguished company, denied this wholly untenable proposition, adding that he had good reason to believe that aluminum had actually been deoxidized by the direct action of carbon.

At a late meeting of the Iron and Steel Institute M. POURCEL takes up the thermochemical cudgels, and in like vein announces that "in intermolecular combustion there is, so to speak, a struggle among the combustible bodies to get hold of the oxygen of which the source is limited. *Those that disengage the most heat draw upon those that disengage the least.*" On this fine foundation of quicksand he builds an aërial castle of vain and unjustifiable predictions as to what reactions can, and what cannot, occur in the metallurgy of iron. Mr. BAUERMAN, who always keeps his head, remonstrated that such reasoning to be useful must be very close; while Professor LEDEBUR, in *Stahl und Eisen*, controverts at length and most successfully POURCEL'S whole paper. But neither of them has indulged in the pleasure of tearing it into shreds, and showing the looseness, the recklessness and sophistry of its reasoning as fully as they might have done. This little recreation is still open to any combative writer who cares to use his horns.

The truth is that not only the kind of reaction which will occur between different substances, but the degree to which it will occur, depend on many conditions, temperature, pressure, ratio between the quantities of the several substances, etc. Now this fact may later be shown to be in accord, at least in some Pickwickian, and let us hope in some scientifically comprehensible way, with the theorem above set forth.

HOW MUCH WILL SILVER RISE IN PRICE?

Under this title the London *Statist* of May 31st discusses the probable effect on the price of silver of the passage of our Silver Bill and the purchase by the United States of 54,000,000 ounces a year, instead of about 29,000,000, as during several years past, an increase of 25,000,000 ounces. Assuming with the director of the United States Mint, the world's production in 1889 to be 130,000,000 ounces, of which the United States furnished, say, 50,000,000, the *Statist* estimates that at an increase in price to even less than 52 pence, or $1.15 per ounce, the consumption of the metal would possibly be checked sufficiently in other countries to supply our increased demand, even without an increased output. But as the production is steadily increasing at even the lowest prices the metal has yet reached, and as it will unquestionably be greatly stimulated by an advance to 50 or 52 pence an ounce, the probability is that our increased purchases will be very easily supplied and the offerings on the world's markets will be greater than before, the consequence of which would be a still heavier decline in price than we have yet had. The *Statist* goes on to say:

"It is reported that at a point the Austrian and other governments will sell to the United States Government stocks of silver they possess, and so satisfy the new demand *pro tanto* without drawing on the increased production at all.

"On the whole, then, the prospect of a great rise of silver, if the United States Government only passes a bill to increase its purchases by 25,000,000 ounces annually, does not seem very well assured. Against it must be placed on the one side the actual fact of an unused annual surplus at the present moment, to be increased indefinitely by a check to consumption which a rise of price would cause; and, on the other side, the fact of a rapidly increasing production even at the recent low price of silver, the certainty of a great increase of production if the price rises, and the great probability of a supply from existing stocks of silver, which may not be inconsiderable.

"Looking at all the facts, we should be inclined to doubt the probability of any material rise of silver—at least, any sustained rise, above the present price, even if the bill to purchase 25,000,000 ounces more should pass; and we should be in no way surprised if in the course of a year or two, notwithstanding these increased purchases, the price should again fall back to 3s. 6d. per ounce or less. Of course, if the purchases should stop, the collapse would be tremendous.

"All this is on the supposition that the United States do nothing more than increase their purchases of silver. Suppose, however, by some accident, they should try free coinage of silver?

"The supposition among the silver people seems to be that this would make a still greater demand for silver than the increase of the annual purchases by 25,000,000 ounces only; but this might not be the case. It is difficult to speculate what would happen; for the financial confusion in America, if a law permitting the free coinage of silver and its unlimited legal tender at the old ratio of 16 to 1 were to pass, would be indescribable. But free coinage of a metal does not mean an unlimited demand for it. People will only take what they want of a metal for monetary as for other purposes, and no more; and as the United States have already more silver than they would want, even if silver were their sole standard, for them to make the coinage of silver free, and to give it unlimited legal tender, would not, by itself, raise the price of silver at all. Whether the price would rise or not would still depend on other measures which might or might not be adopted, such as the continued forced purchase of silver, or the sale of gold, of which the United States Government has a large stock, and the like. What these measures would be no man can tell. All we are pointing out at present is that the free coinage of silver by itself would by no means have the anticipated effect on the price of silver.

"The final conclusion thus is, that as far as any measures yet before the world are concerned, silver is not going to rise very much in price. Even if the United States Government purchases 25,000,000 ounces annually more than it has lately done, it is not going to lift the market indefinitely.

"We must also insist that the collapse of all this silver manipulation is probably not far off. By means of a forced stoppage of the National Bank note circulation, and other devices, room has been made in the United States currency arrangements for the circulation of a paper money called 'silver certificates,' nominally based on silver, but which would have circulated just as well without silver at all. Other two years, if the Silver Bill passes, will suffice to replace the remaining bank note circulation of about £20,000,000 by these silver certificates. After that, if the United States Government forces the issue of any more silver certificates, it must withdraw an equal amount of gold certificates and greenbacks, and either accumulate a stock of unused gold, as well as unused silver, in the Treasury, or *let the gold go*. When that time comes, the collapse in silver will also come. The United States *people* mean to have a gold standard, as the boycotting of silver by the banks, which we referred to last week, clearly proves. But whether they have a gold standard or not, the collapse in silver must come, as no more silver will be usable, and it cannot be expected that even the United States Government will go on indefinitely buying silver which it does not want. When the collapse does come, we need hardly say, the resulting confusion must be serious and widespread."

There is much in these remarks worthy the careful attention of our legislators in Washington. We do not share fully the views of our distinguished financial contemporary, as to the effect of our government buying the increased quantity of silver. The fact seems to have been overlooked that, while the production has steadily increased and would continue to increase even at the lowest prices we have yet seen, the consumption has increased quite as rapidly, and had it not been for the action of Germany in throwing on the market a large amount of the old supply the price would probably not have declined materially under the increased output.

Unquestionably the increase in price will result even more seriously for silver than it did for copper when the French syndicate forced the market, for copper found several very important new uses which cannot be expected for silver. The higher price will lessen consumption both for coinage and in the arts, and all the more so because the conviction is deep and general that the advance in price will be temporary only and the new policy of our government short lived. Every holder of silver will, very naturally, seek to unload on the flood tide, and this is especially true of those governments which for years have been oppressed with large stocks of unsalable silver and have been pining for an opportunity to get gold in its place. The price which silver will reach depends upon how carefully the market is handled. If this be well managed the price will quickly go up to $1.29 (59 pence) an ounce, and a good deal of the metal could be unloaded at or near that figure.

If the foreign silver were excluded from this country by the imposition of a heavy tariff, say 25 or 30 cents an ounce, the price here would remain at $1.29, but the foreign market would go lower than ever, and the absurdity of our government using the taxpayer's money to hold the metal so far above its value in the rest of the world would be too apparent for even Senator STEWART.

Assuming that the rate of increase in production in recent years has balanced the increase in consumption, the question now is, What increase in price will, partly by decreasing consumption and partly by increasing output, balance the increase of 25,000,000 ounces in our government purchases? Any surplus in output over that balance will tend to depress the price of the metal. The first step to secure a permanently higher price for silver should be co-operation by the other great nations, and our present rash proposition to force up the world's markets alone, so far from tending to secure this essential co-operation, will have precisely the opposite effect, and we shall be further than ever from a durable settlement of the vexed question.

The *Mexican Financier*, May 31st, discussing this subject, says our proposed policy would result in "a temporary rise in silver followed in two or three years by a tremendous reaction to the disturbance of all values." We recently (October 5th, 1889) pointed out in these pages that the production of silver will undoubtedly increase much more rapidly than that of gold, and that the tendency is inevitably toward an increasing ratio between the metals. The building of the proposed dam to hold back this accumulating force will be as vain as would an effort to hold back permanently the rising flood of a torrential stream by an earth dam with an insufficient wasteway—when the flood passes over the crest the dam will be found to have vastly increased the disaster.

Irrigation in Russia.—According to the *Novoe Vremya*, it has been decided to restore the ancient gigantic dam on the Murghab, close to the Trans-Caspian Railroad. The Murghab district belongs to the crown, and it is calculated that over half a million acres of land will be rendered fertile by this scheme of irrigation. The cost of the work, which will extend over several years, is estimated at 14,000,000 roubles.

NEW PUBLICATIONS.

TOPOGRAPHICAL MAP OF STATEN ISLAND. By VERMEULE & BIEN, New York. Price, mounted to fold, $18; wall map, with rollers, $15.

This is the first map of its kind of Staten Island yet published by private enterprise, and is a very creditable production. It gives a great deal of detail, which the large scale makes admissible, such as buildings, roads, lanes, 10-foot contour lines, streams, lakes, ponds, marshes, woods, and other topographical features, pier and bulkhead lines, hydrographical contours, etc. The mechanical execution is excellent.

STREET'S INDIAN AND COLONIAL MERCANTILE DIRECTORY. 1888-9. Twelfth issue. Published by Street & Co., London. Cloth, 8vo., 1,359+284+civ. pp. Price, $15.

This is a very extensive directory of the business firms and professional men in all the British colonies, to which is added a condensed directory of leading houses in different lines in the principal cities of the United Kingdom. Considerable miscellaneous information is also given, consisting of tables, trade returns, tariffs, populations, etc., and a number of small maps are inserted.

BULLETIN NO. 1, GEOLOGILAL SURVEY OF TEXAS: A preliminary annotated check list of the Cretaceous Invertebrate Fossils of Texas. By ROBERT T. HILL, F. G. S. A. State Printing Office, Austin, 1889. Paper, 8vo., 57 pp.

The bulletin begins with a brief statement of the present knowledge of the cretaceous in Texas. This is followed by a description of the rocks of the standard section along the Colorado river, which is to serve as the temporary datum for stratigraphical work, and which, the author thinks, will prove invaluable in determining artesian well areas and in classifying soils, building materials, and other economic features. The lists themselves are arranged conveniently for reference, and the accompanying notes should render them very serviceable to the local student, pending the issue of more complete paleontological reports on the region.

HEAT AS A FORM OF ENERGY. By Prof. ROBERT H. THURSTON. (Vol. III, of the Riverside Science Series.) Published by Houghton, Mifflin & Co., Boston and New York, 1890. Cloth, 16mo., 261 pp. Illustrated. Price $1.25.

Professor Thurston's facile pen gives to the public in this little book a very readable and at the same time accurate account of the history, development and present state of the science of thermodynamics. The subject, it is true, is hackneyed, and one about which it could hardly be expected that anything novel remained to be said, at least in a professedly popular brochure like this; yet the author's clear and vivid method of treatment lends a charm almost of freshness to it, and the book is thoroughly readable to students perfectly familiar with its facts and theories, as well as to the novice in science.

The practical bearing of thermodynamic science upon mechanical progress is kept before the reader throughout. Professor Thurston's tone is decidedly conservative, and, while he does not explicitly say so, it is easy to perceive that he does not anticipate revolutionary methods of converting heat energy into work, though admitting the probability of continued improvement of existing methods and appliances. While it is always well to avoid visionary speculations as to what may be in the future, there is still such a wide margin of possible economies in heat engines that the author's conservatism may, however guardedly expressed, be perhaps a little too positive. His idea is that, so far as can be judged from present indications, the steam engine, notwithstanding its wastes, will continue to be the most reliable form of heat engine, though he admits a possible rival in the gas engine. He says: "Whether the practical outcome of all this progress in the physical sciences is to give us new motors and new motive forces, is impossible to see; but we can as yet see no indication that we are to anticipate any such vital change in the methods now familiar to us of utilizing the forces of nature."

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Geological Survey of Texas, Bulletin No. 4. A preliminary annotated check list of the Cetaceous Invertebrate Fossils of Texas. By Robert T. Hill, F. G. S. A. Published by the State, 1889.

Heat as a Form of Energy. By Robert H. Thurston. Published by Houghton, Mifflin & Co., Boston and New York. Pages 261. Price $1.25. Illustrated.

Production of Gold and Silver in the United States in 1889. By Edward O. Leech, Director of the Mint. Published by the Government. 1890. Pages 296.

Street's Indian and Colonial Mercantile Directory for 1888-9. Published by Street & Co., London, England. 1888. Pages 1,360. Price $15. Illustrated.

MAPS RECEIVED.

Topographical Map of Staten Island. By Vermeule & Bien, New York. Mounted to fold, extra binding, price $18. Wall map, with rollers, $15.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Pyrometers and Pyrometric Data.

EDITOR ENGINEERING AND MINING JOURNAL:

Since writing the notes on pyrometers, etc., which you published on page 637 of your issue of June 7th, in which I compared Gredt's and Akerman's results, I have met Akerman's note making a like comparison, and, owing to a different mode of approach, bringing out other points of interest.*

Briefly, Akerman finds that his own results imply much lower melting points, and much greater differences between the melting points of different slags, than Gredt finds.

As Akerman did not determine the melting points, but only the total heat of solidification, he proceeds to deduce the probable melting points

* *Stahl und Eisen*, Vol. X., P. 424, May, 1890. From *Jernkontorets Annaler*, 1889, V. and VI.

to which his results point by assuming probable mean specific heats. His results are compared with Gredt's in the accompanying table:

Gruner took the specific heat of blast furnace slags at	0·325
Rinmann for barely melted slags	0·31
Schinz, minimum	0·29

Akerman's results indicated that it varied between 0·29 and 0·33; and further, that it rose with the melting point, being higher for refractory than for fusible slags. If now, as in column VI., we take the mean specific heat as 0·30, then the melting points of No. 11, Gredt's most fusible, is some 207 degrees C. (367 degrees F.) higher according to Gredt than according to Akerman. With the more refractory slags this difference decreases, but it is still 84 degrees C. (183 degrees F.) for No. 5. Further: Akerman finds four times as much difference between the melting points of these two slags as Gredt. Let us now briefly look at these two points of difference separately.

First, as regards Gredt's melting points being as a whole higher than Akerman's. We might anticipate that they would be nearly alike.

It is true that Gredt's points were for not-previously fused, Akerman's for previously-fused slags; but Gredt's were points of incipient plasticity, Akerman's of nearly complete fluidity; and one difference might be expected to about offset the other. Akerman further claims that his results, reached calorimetrically, while they might be too high, could not well be too low, except through error of observation, which could hardly repeat itself so regularly as to give the beautifully concurrent series of results which he reached.

Two explanations of the discrepancy suggest themselves. The bending-points of the Seger pyramids, by means of which Gredt made his determinations, may have been assumed too high, or Akerman may have assumed too high a mean specific heat. Akerman infers that the former of these suppositions is probably true, *i. e.*, that too high bending-points have been assumed, at least for certain of Seger's pyramids. For were we to take the mean specific heat of his slags even as low as 0.25, the melting-point of the most fusible would rise only to 1,358 degrees, or 52 degrees below the bending-point reported by Gredt.

I do not think, however, that we can locate the source of such comparatively small discrepancies with confidence yet. Thus, in some preliminary observations, in which indeed certain corrections remain to be made, I found the mean specific heat of limebisilicate to be 0·253, 0·256 and 0·258, and that of the silicate $C_4 F_e Si_{10}$ to be 0·262 and 0·249; and in some of these cases the temperature rose above 1,800 C.

If, now, we assume the mean specific heat of slag 5 as 0·2826, then its melting-point, as inferred from the total heat of solidification which Akerman gives, would be 1,451 degrees, or exactly what Gredt finds it to be.

But the fact that Akerman's results show a greater difference than Gredt's between the melting-points of different slags cannot be due either to Akerman's assuming too high specific heats for all the slags, or to Gredt's assuming too high bending-points for all the Seger pyramids. But it may be due to any or all of the following causes: 1. The difference between the melting-points of the different Seger pyramids may be less than supposed; 2. The difference between the softening-point of not previously-fused silicates and the melting-point of previously fused ones may be less in case of refractory than in that of fusible slags; and, 3, the latent heat of crystallization (or more broadly solidification) may be greater in case of refractory than in that of fusible slags. To these, which Akerman notes, I add that the mean specific heat of the slags may not vary in just the way that Akerman assumes. For instance, if we take the mean specific heats of slags 5, 11 and 13 as 0·3285, ·299 and 0·3162, the differences between their melting-points reckoned from Akerman's data would be the same as those which Gredt finds (cols. X. and XI.), or, if we take these mean specific heats as 0·2826, 0·256 and 0·2725, their melting-points as reduced from Akerman's data would coincide exactly with those given by Gredt (cols. XII. and XIII).

From all of which my inference still is that Gredt's results tend to confirm Akerman's most important ones, to wit those showing the relative fusibility of different slags; and that we can hardly yet locate confidently the source of their discrepancies.

Gredt's results.			Akerman's results.		Four sets of assumed mean specific heats, and the corresponding melting-points implied by column V.							
					Akerman.				Assumption 3		Assumption 4.	
					Assumption 1		Assumption 2					
I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.
Gredt's designation number.	O in Al_2O_3 / O in CaO	Bending point, Gredt.	O in Al_2O_3 / O in CaO	Total heat of solidification.	Mean specific heat.	Melting point.	Mean specific heat.	Melting point.	Mean specific heat.	Melting point.	Mean specific heat.	Melting point.
1..	0·00	1,570°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2..	0·05	1,526°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3..	0·11	1,492°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4..	0·18	1,468°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	0·20	428	0·30	1,427°	0·320	1,338°	.....	.....	.....	.....
5..	0·25	1,451°	0·25	410	,,	1,367°	0·312	1,314°	·3285	1,248°	·2826	1,451°
...	...	...	0·30	380	,,	1,267°	0·305	1,246°	.....	.....	.....	.....
6..	0·33	1,438°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	0·40	363	0·30	1,210°	0·299	1,215°	.....	.....	.....	.....
7..	0·43	1,430°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	0·50	349	0·30	1,163°	0·291	1,199°	.....	.....	.....	.....
8..	0·54	1,422°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9..	0·67	1,417°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	0·70	347	0·30	1,157°	0·290	1,197°	.....	.....	.....	.....
10..	0·81	1,412°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	0·90	355	0·30	1,183°	0·296	1,200°	.....	.....	.....	.....
11..	1·00	1,410°	1·00	361	,,	1,203°	0·299	1,207°	·299	1,207°	·256	1,410°
...	...	...	1·20	377	,,	1,257°	0·305	1,236°	.....	.....	.....	.....
12..	1·22	1,430°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
13..	1·50	1,468°	1·50	400	0·30	1,333°	0·310	1,290°	·3162	1,265°	·2725	1,468°
14..	1·86	1,526°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	2·00	430	0·30	1,433°	0·320	1,344°	.....	.....	.....	.....
15..	2·33	1,613°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
...	...	...	2·35	461	0·30	1 537°	0·327	1,410°	.....	.....	.....	.....

H. M. HOWE.

GEMS AND PRECIOUS STONES.

The *American Journal of Science*, of New Haven, Conn., in its June number, says: "The American reader, who is attracted to the subject of gems, will find much to interest and instruct him in the handsome volume by Mr. Kunz, published by the Scientific Publishing Company, of New York. Starting off in each chapter with a brief mineralogical description of the species under discussion, the author goes on to give a detailed account of its occurrence in this country, the value of the stones found, the present owners of the finest ones and other allied points, embracing much information which has not been brought together before, and which the author's position has given him peculiar facilities for collecting. The fact that the book has been written in popular form for the general public should give it a wide range of readers. At the same time this removes it from the kind of criticism to which a work striving for minute scientific accuracy would be liable. The publishers have shown much enterprise in the handsome form in which the book has been put as regards paper and press work, and the numerous colored plates which ornament it are of very unusual excellence; it is rare indeed that the delicate coloring of the various gem stones, and of the natural mineral specimens, has been reprodaced so faithfully."

La Nature, of Paris, France, in its issue of May 31, says: "Gems and Precious Stones of North America," a popular description of their occurrence, value, history, archæology, etc., by George F. Kunz. The author of this magnificent book, which we have just received from New York, has been the organizer of the fine collection of precious stones of North America so much admired by the visitors at the universal exhibition of 1889. Mr. Kunz, who is one of the most eminent mineralogists in the United States, describes the precious stones of his rich country, relates their history, gives their value, and reports everything relating to their use in ancient and modern times. The book, admirably edited, enriched with innumerable engravings and colored plates of the finest kind, showing samples of emeralds, amethysts, agates, etc., will be also precious to the mineralogist, lipidary and amateur.

THE MANNESMANN PIPE MOLDING PROCESS.

The Mannesmann invention of making seamless tubes has, since Mr. Fr. Siemens read a paper on that process before the British Association of Engineers in 1888, made steady, but until very recently, unostentatious progress.

An indication of the importance attributed to the process in Germany was the presence of a great many dignitaries of the empire at a lecture on that subject by Prof. Reuleaux before the Berlin section of the German Engineers' Association a few weeks ago.

From a paper by Mr. J. G. Gordon, in the *Iron & Coal Trades Review*, we glean the following abstract:

Messrs. Mannesmann produce weldless or seamless tubes of steel, or any other ductile metal, such as copper, bronze, delta metal, lead, or aluminum, by rolling them in skew-rolls, or rolls which are not parallel either to one another, or to the bar or other material to be treated by them.

Whilst in the ordinary rolls the bar to be rolled is put in at right angles to the rolls which revolve in opposite directions, in the Mannesmann tube mill both rolls revolve in the same direction, and the bar to be acted upon is placed between them lengthways, while the axles of the rolls are not parallel to one another. In front of the rolls is a tube acting as a guide for the bar, which is pushed in between them.

These rolls revolve at about 200 to 300 revolutions per minute, and their action on the hot and therefore plastic steel, whereby this is stretched and a hollow made in the center, is explained by F. Siemens in the following way:

"To obtain a simple forward spiral action of the bar, the length of the rolls is immaterial; it will take place when the rolls are reduced to the form of thin discs. Supposing the discs to be infinitely thin, or what is the same thing, that their outer edges are reduced to a mathematical line and no sliding motion takes place, the bar must still move forward spirally, its spiral velocity being equal to the velocity of the outer circumference of the discs. If, instead of one pair of such thin discs, several pairs of discs of regularly increasing diameters are made to revolve on the same axis, the outer circumference of each disc will revolve with greater velocity than that of the preceding one. The same bar is, however, drawn forward through the several pairs of discs, and thus as each part of the bar enters successively a more advanced pair of discs, the velocity with which that portion of the bar rotates increases, and it is drawn forward by each succeeding pair of discs as they catch hold of it with ever-increasing speed.

"When a bar passes through such a series of discs, no slipping being possible, its material cannot retain its original area or volume. The diameter of the bar being regulated by the discs, while simultaneously a violent stretching action is carried on, the material required can only be drawn from the inside of the bar, and thus a hollow space is formed.

"Instead of this arrangement of discs a conical, or rather conoidal, pair of rolls, which amount to the same thing as the discs, considered as joined together, may be provided. A bar of suitable dimensions will, when passed through the Mannesmann rolls, if its substance is sufficiently homogeneous and plastic, undergo a violent twisting and stretching action, the fiber being spun as the fiber in a rope. The bar in its passage through the rolls is twisted as a thread in a spinning machine. Unable to be fed from the outside, the rolls preventing a reduction of the diameter, the bar will draw on the interior for a supply of material.

"The tube is made by placing a bar between the conoidal rolls at the part where, their diameter being least, the speed at which they move to make a revolution is also least. The rolls seize the bar and draw it into contact with parts of the cones which move more and more rapidly, though, owing to the way in which the rolls are set, the space left between them for the passage of the bar decreases slightly and thus necessitates the shifting of a certain amount of material. Soon after entering the rolls a small central fracture is formed which widens out to a hollow space as the increased stretch is made to take effect in an increased twist acted on from the surface. It is the increasing twist of the fibre of the ingot while passing through the rolls and the peculiar relation between longitudinal and turning action which converts the bar into a tube. In order to smooth the inside and, when required, to en-

large the tube, a mandril enters the hollow; but the mandril takes no part in the process of making the hole."

If, be forebeing passed through the Mannesmann rolls, the ends of a bar are slightly drawn down under the hammer, so that for an inch and a half at both ends its diameter is decreased so that the rolls cannot act on them, a tube will be formed so far as the rolls could act on the bar, and the ends will remain solid.

Professor Finke, in Berlin, has by an ingenious apparatus tested the pressure in the interior of the tube and found it equal to very nearly $\frac{1}{10}$ of an atmosphere; the gas contained in the hollow he ascertained as 99 per cent. of hydrogen, the remaining one per cent. being probably nitrogen.

The power required to produce the tubes is from 2,000 to 10,000 horse power, according to the dimensions of the tube; but this great power is only required for a short time; for each tube made thirty to forty-five seconds suffice to convert a bar 10 to 12 feet long, and 4 inches in diameter, into a tube, and during the time while the next bar is brought up, adjusted in the guides and the finished tube removed, so much energy is accumulated in the fly-wheel that a steam engine of about 1,200 horse power is sufficient to do the work.

The fly-wheel, designed by Messrs. Mannesmann to guard against bursting, consists of a cast-iron hub, to which are securely bolted two discs of steel plates of about 20 feet in diameter; round the periphery of the wheel thus formed about 70 tons of No. 5 gauge wire are wound, under a tension of about 50 pounds, thus binding the whole securely together. This fly-wheel revolves 240 times per minute, the periphery having a speed of 2.85 miles per minute, and it works on the main shaft from which the tube mill is driven by means of helical-toothed steel wheels.

Behind the steam-engine is the Siemen's regenerative furnace, heated by radiation, which is 33 feet long by 21 feet wide, with an area of 789 square feet.

A small steam engine near the rolls is used for adjusting them. Special devices enable the foreman roller to adjust the rolls to $\frac{1}{32}$ inch.

At Landon, near Swansea, the Mannesmann Tube Company has twelve machines for cutting screws on tubes of any diameter, from 2 inches to 12 inches. The screws cut by these machines are the American tapered-thread screws, cutting deep at first and diminishing the depth on every turn, thus making the end of the tube slightly conical.

The following tables give the results of the tests of the tubes under compression. The one and two series are Mannesman tubes, the third shows tests of lap-welded wrought iron tubes by way of comparison.

TABLE I.

STEEL TUBES.

External diameter of the tubes before turning.....4¼ inches.
Length over all .....1 foot 5½ inches.
Length between shoulders.....10 inches.

	External Diameter.	Internal Diameter.	Thickness.	Area.	Ultimate Strength.
	Inches.	Inches.	Inches.	Square Inches.	Tons per sq. in.
A	4.45	4.36	.045	.622	20.9
B	4.47	4.33	.07	.939	25.53
C	4.5	4.31	.095	1.315	27.7
D	4.565	4.325	.12	1.666	.....

NOTE.—The testing machine was not strong enough to have any effect on tube D.

A strip cut parallel to the axis of a tube showed a breaking strain per square inch of 35 tons, an elongation in 8 inches of 25 per cent., and a contraction of area of 54.2 per cent.

TABLE II.

STEEL TUBES.

External diameter..... 3½ inches.
Length over all..... 1 foot 5½ inches.
Length between shoulders.....10 inches.

	External Diameter.	Internal Diameter.	Thickness.	Area.	Ultimate Strength.
	Inches.	Inches.	Inches.	Square Inches.	Tons per sq. in.
A	3.31	3.2	.055	.600	18 6
B	3.3	3.18	.06	.611	25.3
C	3.36	3.19	.085	.871	28
D	3.29	3.03	.13	1.10	34.9

B, C and D of this set failed without fracture.

A strip cut parallel to the axis of a tube gave when tested in tension: breaking strain per square inch 37 tons, elongation 20 per cent. in eight inches and contraction of area, 42.5 per cent.

TABLE III.

LAP-WELDED WROUGHT IRON TUBES.

External diameter..... 3⅜ inches
Length over all..... 1 foot 5½ inches
Length between shoulders..... 10 inches

	External Diameter.	Internal Diameter.	Thickness.	Area.	Ultimate Strength.
	Inches.	Inches.	Inches.	Square inches.	Tons per sq. in.
A	3.63	3.55	.035	.399	17.54
B	3.7	3.56	.07	.802	18.08
C	3.73	3.53	.10	1.14	19.98
D	3.78	3.54	.12	1.38	20 9

Although a large series of tests is needed to deduce many definite conclusions, these are of interest to show that the Mannesmann tubes, when they give way, bend, and even when completely crumpled up, do not burst or crack.

In all other processes for making weldless tubes the hollow cylinder, whether cast or bored, is drawn through a series of gradually diminishing dies, and over an appropriately shaped mandril, or a draw-bench similar to those employed in wire drawing. This necessitates frequent annealing of the material, as otherwise it would soon become brittle.

These successive drawings tend to produce a longitudinal fibre in the metal, just as the ordinary rolling of iron and steel bars and strips does, and such a longitudinal fibre necessarily tends to make the tube weaker, especially as regards internal pressure, than the Mannesmann tubes with a spiral fibre, the quality of the metal and all other conditions being the same in both tubes.

That a spiral fibre has long been regarded as a source of strength is shown by the method adopted by gunsmiths for making shot-guns of good quality. These are made by welding together the best quality of scrap iron, such as horseshoe nails. These are carefully made into small rectangular rods, which are then coiled round a mandril and welded together, thus forming a spiral fibre. On a large scale this process is used by Lord Armstrong for making the wrought iron coils for his celebrated guns.

If two small bottles made out of a Mannesmann tube and a lap-welded boiler tube respectively are filled with boiled water, and placed in a freezing mixture, the expansion which takes place on the solidification of water to ice exerts sufficient force to burst the lap-welded tube, but the Mannesmann tube withstands this great pressure. Another small tube an inch in internal diameter, and about 3-64th of an inch in thickness, was subjected to an internal pressure of 3 tons 15 cwt. to the square inch, at Messrs. Siemens Brothers' works at Charlton, when the leather washer closing one of the ends gave way. When taken out the tube was distinctly warm to the touch, but otherwise exactly the same as before the test was applied. This pressure of 3 tons 15 cwt. per square inch is equal to a tensile strain on the metal of over 70 tons per square inch.

The power of resisting great internal pressure makes the tubes particularly well adapted for vessels made to contain gases at high pressure, such as oxygen and carbonic acid.

At the Austrian Mannesmann Works, at Komatan, more than 600 tons, or twenty-five miles of four-inch and three-inch tubes about quarter-inch thick, have been tested to a pressure of 2,000 lbs. per square inch, and passed by Mr. E. Woods, inspector. These tubes have been sent to Chili; they are intended for a high-pressure water main for pumping water up to the rainless nitrate deposits.

But the severest test which the Mannesmann tube can possibly be subjected to is the process of manufacture itself. If there is any flaw in the bar, or if the furnace man has been careless in the heating, the Mannesmann rolls refuse to make a tube of it. This process is, in fact, so far as regards what is called humoring the metal, to the ordinary rolling process what the tilt hammer is to the late Mr. Nasmyth's steam hammer, so that every tube made by this process comes into the world ready tested.

The tubes can be used for all ordinary purposes, for water-pipes, especially where water has to be carried long distances at high pressure.

TABLE IV.

Cast Iron Pipes.			Steel Tubes.		
Internal Diameter.	Weight per Foot.	Weight per Mile.	Internal Diameter	Weight per Foot.	Weight per Mile.
	Lb.	Tons.		Lb.	Tons.
3	13·5	31·8	3	6·2	14·6
4	18·5	43·8	4	8·2	19·3
5	24·5	58·4	5	10·1	23·8
6	31·1	73·3	6	12·1	28·5
7	37·3	87·9	7	14·1	33·2
8	45·0	106·0	8	16·0	37·7
9	52·9	124·7	9	18·0	42·4
10	62·0	146·1	10	20·0	47·1
12	74·5	175·6	12	25·0	58·6
18	140·0	330·0	18	46·8	110·1

Table IV. shows the comparative weights per foot and per mile of cast iron pipes and Mannesmann tubes. It is obvious that wherever such pipes have to be transported long distances from the place of manufacture to the place where they are to be used, what a great advantage the saving in the weight to be carried will be, more especially in cases, like in South Africa and Australia, where railway transport is not often available.

Further, their lightness and the greater lengths to which they can be made will effect a large saving in the cost of labor in laying them down and in the cost of the joints, both of which form a serious item in the cost of any pipe line.

The Mannesmann tubes are capable of resisting much higher internal pressure in comparison to the thickness of their shells, or, in other words, their weight per foot. Whilst cast iron pipes will hardly stand more than 200 pounds per square inch, and welded tubes are not as a rule safe above 1,000 pounds per square inch, the Mannesmann easily withstand 2,000 pounds per square inch.

The length up to which these tubes can be easily made is shown by coils made of a tube three inches in internal diameter, and about ¼in. thick by 70 ft. long; it weighs about 6½ cwt.

Hollow axles for railway and other wagons, especially for field-gun carriages, and hollow shafts and poles for carriages, can be readily made from these tubes, as well as gun barrels and gun tubes and shells. The Prussian Government has already given the German Mannesmann works large orders for tubes from which to make military stores of various kinds; for instance, the lances with which the German cavalry is about to be armed are to be made of Mannesmann tubes.

At present there are five works making, or about to make, tubes by this process.

First, the parent works at Remsheid, in Rhenish Prussia, where all the early experiments were carried out by Messrs. R. & M. Mannesmann; the works in South Germany, at Bons, near Saarbrücken; the Austrian works at Komotan; the works near Duisburg, specially erected for making tubes of copper and its alloys; and, lastly, the works at Landore, near Swansea, belonging to the Mannesmann Tube Company, which has acquired Messrs. Mannesmann's English patent rights. At these works, which are under the management of Mr. Charles Mannesmann, a brother of the inventors, three Mannesmann mills are now at work, and two more are in course of erection.

ARCHER COMBINATION FURNACE.

In our issue of March 1st we illustrated and described the gas fuel process of J. B. Archer, by which there is no doubt the problem of securing an economical heat from a water-oil gas has been solved. As we then stated, this system is in use in many of the leading iron mills in this country, and since that date it has made still further progress, having been adopted by Messrs. Cooper, Hewitt & Co., at the Trenton Iron Works and elsewhere.

Mr. Archer has now turned his attention to appliances for the better utilization of his gas in all kinds of manufacturing establishments where heat or light is required. His latest invention is a combination glass melting and blowing furnace, which by entirely practicable modifications may be utilized as a pot furnace or a tank furnace for melting glass, an attached combination blow furnace, or for melting pig for malleable iron, for puddling iron, etc., or by further modifications it may be turned into an iron and steel heating furnace, or it may be lengthened out for a series of furnaces, small or large, for heating, welding, etc., with reinforcing gas lines and burners to each, providing for any desired temperature in each compartment or section of this multiform furnace, and by its peculiar arrangements utilizing all the developed heat.

What is claimed in Mr. Archer's latest patent is:

The combination, in a furnace, of a combustion chamber, a chamber in which the material to be heated is placed, pipes placed in the base thereof and connected with the combustion chamber, and a layer of sand over the pipes, whereby the thickness of their covering may be changed at will.

The combination, in a furnace, of a combustion chamber, a chamber in which the material to be treated is placed, a bridge wall located between the two, air chambers located in the roof of the furnace and in the bridge wall communicating with the interior of the furnace, a pipe situated at the base of the interior of the furnace connected with the base of the combustion chamber and with the air chambers, and a layer of sand over the pipe, whereby the thickness of its covering may be varied at will.

The combination, in a furnace, of a combustion chamber, a checker work therein, gas burners projecting into the chamber, a chamber in which the material to be treated is placed, a bridge wall located between the combustion chamber and the chamber in which the material to be treated is placed, air chambers located in the roof of the furnace and in the bridge wall communicating with the interior of the furnace, a pipe situated at the base of the interior of the furnace connected with the base of the combustion chamber and with the air chambers, a layer of sand over the pipe, whereby the thickness of its covering may be varied at will, and supplemental burners consisting of perforated tiles in the interior of the furnace between the pipes, and gas supply pipes connected with the burners.

The combination, in a glass furnace, of a combustion chamber, a chimney, a glass-melting chamber and a reheating chamber situated between the combustion chamber and the chimney, and a checker work in the reheating chamber for storing up heat.

Referring to the accompanying drawings, in which corresponding parts are designated by similar letters, Fig. 1 is a side elevation of a combined pot and reheating furnace. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a horizontal section of the same on line *X X* of Fig. 2. Fig. 5 is a vertical longitudinal section of a combined tank and reheating or blowing furnace.

The pipe *a*, for supplying gas to the furnace, is connected with a gas-generating apparatus *P*, and is provided with jets a^1, which open into the combustion chamber *A*, which is partially filled with a checker-work, A^1, of fire-brick or other refractory material, against which the gas impinges, mixing with heated air rising from the air-chamber A^2, which is situated below the combustion chamber, through the said checker-work A^1. The flame resulting from the ignition of the gas flows over the bridge wall, *B*, into a working or melting chamber, *B*, which may either have a flat hearth for melting glass in pots, as shown in Figs. 2 and 3, or a hearth having a refractory lining T-shaped, in the usual manner of tank melting furnaces, as shown in Fig. 5, or by changing the character of the chamber it may be adapted to other purposes.

In Fig. 5 of the drawings the hearth-lining *T* rest upon brick-work T^1, which in turn rests upon metallic plates T^2, under which are located the air-passages T^3 for the cooling of the bottom of the hearth. The products of combustion then pass through the neck *b* into the reheating chamber *C*, provided with blow-holes *L* for the introduction of the blowers' tubes, and which thus forms a blowing furnace, and afterward escape through the neck c^1 which may be provided with a damper c^2 into the chimney *S*.

A recess *E* is formed under the reheating chamber, through which air-pipes *F F F* pass from side to side, being connected in series and heated by the heat thrown off by the products of combustion in their passage through the reheating chamber. One of the end pipes of the series opens at *f* into the air, or may be connected with a suitable air-blower, while the other end pipe of the series is connected by the pipe f^1 to a so-called "T-piece" f^2, one end of which terminates within the air-chamber A^2, while the other opens into the chamber *D*. The chamber *D* is formed in the bridge wall and continues downward into the base of the furnace. In the roof of the furnace, which is curved over the combustion chamber, is formed a chamber *D*, by preference located over the bridge wall and connected with the chamber *D* therein by vertical flues D^1, built in the sides of the furnace. In the bottom of the chamber D^2, which is constructed of perforated tiles or bricks, is a double row of orifices *d d*, through which heated air which flows into the chamber *D* from the chamber D^2 escapes into the furnace and assists into the combustion of the gas.

The pipes *F F F* in the recess *E* may be covered with a layer of brick-work, as shown in Fig. 2, or they may be covered with sand.

G is a supplementary burner for giving additional heat to the reheating chamber at certain stages of the process, if required, and has an open checker-work *G* in front of it to insure perfect combustion of the gas.

In Fig. 5 is shown a checker-work *H*, consisting of two or more tiers of loosely-piled soap-brick placed upon the floor of the blowing chamber. When the furnace is running, these become highly heated and serve as a reserver of heat, materially assisting the operations of blowing by the large amount of heat they absorb and again give out by radiation.

At *K K K*, Fig. 3, are shown the working openings of the melting-chamber, through which the pots are charged and the melted glass removes from the pot *J J J*, and at K^1 K^1 K^1, Figs. 5 and 6, are shown openings through which the material is introduced into the furnace, which openings, as well as the blow-holes *L*, are covered wish counterpoised doors *o o o*.

M is a large door through which the pots are introduced into the furnace, and is provided with an opening m^9, through which the blow-tubes may be thrust into the furnace to heat them, and *N* is a small door inside of which may be placed a small pot of melted glass, the use of which is well known in the art, and needs no description here, and a door M^9 may be provided as shown in Fig. 1, to afford additional means of access to the melting chamber.

For additional heating the reheating chamber cylindrical perforated tiles *R R* may be set in the bottom thereof, between the air-heating pipes *F* and under the checker-work *H*. These tiles are supplied with gas by the pipes *r*, leading from the producer *P*, which gas, rising through the tiles, is ignited in the checker-work *H*, and forms a simple and affective means for highly heating the reheating chamber, as is desired when used for reheating purposes.

The operation of the furnace is as follows:

The pots are introduced into the furnace hot, and remain there until they are destroyed in the case of the pot furnace. The glass mixtures having been introduced, the heat is pushed rapidly up to the desired temperature in the melting chamber *B*, sufficient to melt the glass, the hot products of combustion on their way to the chimney heating the reheating chamber *C*. When the contents of the furnace are entirely melted, the blowing process commences. If the reheating chamber is not hot enough, it may be further heated by means of the burner *G*. The checker work *H* in the bottom of the chamber acts as a reservoir of heat, and by its great radiation materially assists in this process. The air flowing through the pipes *F F F* is heated by the products of combustion, and then flows through the pipe f^1 and T-piece f^2 into the chambers *A* and *D*, the amount of air admitted to each chamber being capable of control by means of dampers $f^3 f^3$. The air admitted through the chamber A^2 rises through the checker-work A^1 into the combustion chamber *A*, where it enters into combustion with gas issuing from the jets a^1, the resultant flame passing over the bridge wall B^1, where it unites with the air flowing through the holes *d*, which has been still more highly heated by passing the bridge wall, thus increasing the heat of combustion. Any glass that may be spilled, and the slag formed by the running of the pots and bottom, are drawn off by the slag holes *s* and s^1, while *V* is a slag-hole by which the bottom of the hearth of the tank furnace may be cleaned when desired.

Mexican Onyx.—Mexican onyx is a form of stalagmite, and its colors are formed by oxides of metals in the earth over the caves through which calcareous water passes. Gold is represented by purple, silver by yellow, iron by red, copper by green and arsenic and zinc by white.

Volcanic eruptions and earthquakes have almost destroyed the caves in which onyx exists, and the native Indians who mine it have to cut through masses of ruins. Blocks of the material are quarried in a primitive way, in order not to shatter the substance. Deep round holes are drilled by hand on a line. In each hole is inserted a snugly fitting piece of wood, which has been grooved from end to end. Hot water is poured into the grooves at night. This swells the wood and the block is split along the line without damage. The natives then saw the blocks into slabs and polish the surface by hand. Each piece is semi-transparent, and when placed between the eye and a strong light presents a remarkably beautiful effect in form and color.—*Jewelers' Weekly.*

Diamond Mining in Ceylon.—Ratnapura, the city of gems, is the center of a district 20 or 30 miles square, in almost all of which a stratum of gravel 6 feet to 20 feet under the surface exists. Throughout this area gem pits are to be seen near the villages, some being worked now, others being abandoned. The natives work there in companies of six or eight and pay a rupee per man per month for the privilege of working a certain allotment, where they begin by marking off a square of about 10 feet.

After removing about three feet of soil, the sounding rod, a piece of iron about half an inch in diameter and 6 feet long, is used to sound for the gravel. If successful, the digging is begun in earnest till about 4 feet deep. On the second day gravel is taken out by baskets handed from one man to another till all within the square is excavated. Should the miners find the soil fairly firm at the bottom of the pit, they tunnel all around for about two feet, drawing out the gravel and sending it up also to be heaped with the rest, which usually completes the work of the second day, a watchman remaining near it all night.

On the third day the gravel is all washed in wicker baskets by a circular jerking motion, which throws out all the surplus light stone and rubbish till a good quantity of heavy gravel is left in the bottom, which is carefully examined. There is hardly a basketful that does not contain some gems of inferior value, which are usually sold by the pound for about nine rupees. Should no valuable stones be found another pit is sunk, and so on until one or two or perhaps three really valuable gems are unearthed, when the work is stopped and the whole party goes off to Ratnapura with the prizes. If these are worth, say, a few thousand rupees, they are kept secret and only shown to one or two men of money, who make the owners an advance and look after the custody of the precious stones.

Then the miners gamble and drink for some time, till another advance becomes necessary, and so on until half the value is obtained. Then the party, with the mortgagee, proceeds to Colombo, or Italutara, where rich Moorish traders are summoned to purchase, and the gems soon find their way to London. The general public knows nothing about these transactions, and valuable gems are never heard of in Ceylon, and scarcely see the light of day until they reach Bond street.

The natives have a great fear of exposing their finds till they are sold, and they have superstitious ideas about showing them. This system has been in vogue for centuries. It is only occasionally one hears of a native having enterprise enough to dig a few feet below the first gravel to see if a second bed of gravel is within reach, for they fear the expense of bailing out water, which increases as the greater depth is attained, although the second gravel is well known to be much richer than the first.—*Jewelers' Weekly.*

PRE-COLOMBIAN METALLURGY IN VENEZUELA.

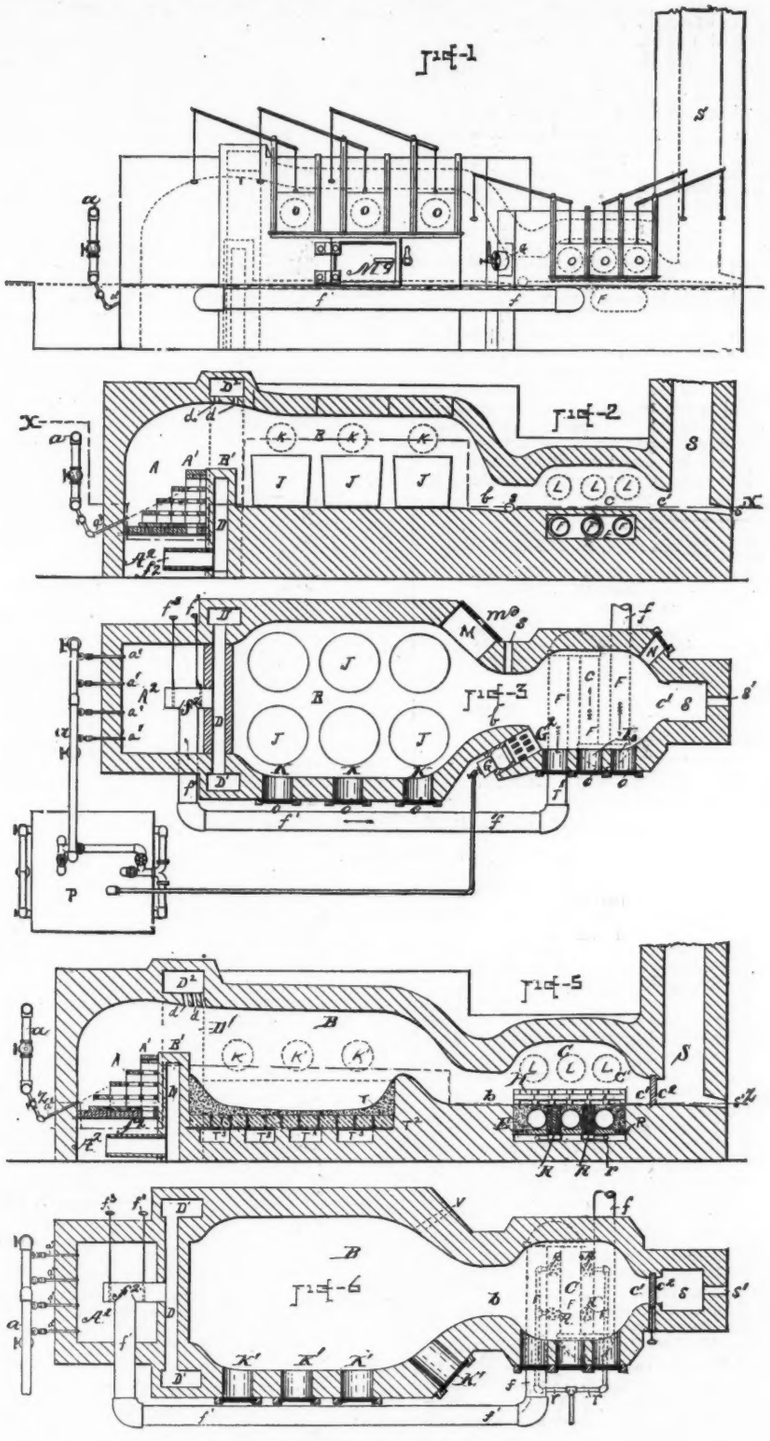
By M. V. Marcano.

The knowledge of the composition of ancient metallic objects of which the origin and relative date are indisputable is of great importance to the history of the progress of humanity.

M. Berthelot has already established in an obvious manner by the chemical analysis of a metal object dating from more than 4,000 years before our era, that the "age of bronze" was preceded by the "age of copper."

Once the antiquity of the metallurgy of copper established for the old world, it is interesting to make investigations in this direction for the new continent. Already Vauquelin, at the beginning of the century, had analyzed a metal chisel coming from the Incas of Peru, and recently, in 1883, M. Damour had determined the composition of another similar instrument, brought from Quito by Boussingault; the two objects of almost dentical composition were formed of a mixture of copper and tin.

The Anthropological Explorations of Venezuela, with which I was commissioned by the government of this country in 1887, brought to light among the pre-Colombians of the littoral a civilization which they did not expect to find among people considered, according to the interested accounts of Spanish historians, as barbarous tribes, no more advanced than those who wander in the savannahs of Orinoco (Dr. G. Marcang, "Ethnographie pre-Colombienne du Venezuela, Valleés d'Aragua et de Caracas)." But the numerous excavations I worked did not reveal the least object in metal among the great quantity of every kind they enabled me to collect.



ARCHER COMBINATION FURNACE.

In spite of the explicit testimony of the historians of the conquest of Venezuela which signalizes the existence of metallic objects among the natives of the country, that of Humboldt denies the existence of metallurgy among them, founding his assertion on the geognostic study he had made in traversing the country, where he did not find any signs even of a probable auriferous stratum. The illustrious traveller explains the existence of these objects in gold among the Indians in their commerce from place to place with those of Cordillera, communications, however, which are far from being demonstrated. I chanced to discover, near San Juan de los Morros, a gold mine worked by the pre-Colombians, as is attested by an excavation 20 meters in diameter by at least as many in depth, made in the middle of the ridge line of the hill containing the

stratum. The ore forming the almost vertical vein is a schistose rock, soft, completely disintegrated, containing gold and silver respectively in the proportion of 30 grams and 1 kilogram per ton. The ore yields at the simple washing and beating one quarter of the gold contained.

A few days ago, near the village of Tequia, situated at a distance of 30 kilometers from Caracas, the pickaxe of an excavator uncovered several sarcophagi in earthenware, containing bones, ornaments of various substances, and a certain number of metal objects, which unfortunately have been distributed among a number of persons. I was able to obtain three of these objects, from which I took some filings for the purpose of analysis, the results of which form the object of this note.

The first is a circular medal bearing on one of its sides a design in chased work representing a scorpion or some such thing. Nos. II. and III. are pendelogues, obtained by fusion, and the execution of which is fairly well done. The analyses gave:

	I.	II.	III.
Weight of objects	....	15·170g	6·196g
Gold	13·3g	23·7	7·6
Silver	73·3	5·8	traces
Copper	13·4	47·6	38·4
Iron	....	22·9	54·0
	100·0	100·0	100·0

One can say that No. I was made by hammering with native gold very rich in silver, and containing copper, as is sometimes the case with the products extracted by myself from the gold mine as I have stated. Nos. II. and III. are, without doubt, the result of an alloyage *ad hoc*. Within gunshot from the place where the sarcophagi were disinterred there is a vein of copper which crops out on the side of the hill, and is composed of carbonate of copper closely mixed with oxide of iron. It contains neither gold nor silver. *Per contra*, history mentions a gold mine worked by Indians before the conquest, situated near Tequai, but in an opposite direction to that of the copper mine. The objects analyzed seem to me interesting, because they show the existence in Venezuela of a pre-Colombian metallurgy, which far from confining itself to the extraction of native gold, made alloyages of the precious metal with that obtained by reducing the ferriferous copper ores.—*South American Journal.*

THE WORLD'S PRODUCTION OF COAL AND PIG IRON, IN METRIC TONS.

	Coal.	Pig Iron.
Great Britain (1889)	176,916,724	8,215,336
United States (1889)	132,419,342	7,601,525
Germany (1889)	81,960,000	4,387,504
France (1889)	24,588,880	1,722,480
Belgium (1889)	19,810,118	847,260
Austria and Hungary (1888)	23,500,000	761,606
Russia (1887)	4,464,174	532,649
Austria (1889)	2,664,172	
Japan (1888)	2,076,744	
Sweden (1888)	300,000	457,052
Spain (1888)	1,203,119	232,000
Italy (1887)	327,665	12,265
Other countries (1889)	10,000,000	100,000
Total in metric tons	480,230,938	24,902,677

IMPROVED MINE CAR WHEELS OF THE SUSQUEHANNA COAL COMPANY.

The Susquehanna Coal Company, after trying a number of wheels from various manufacturers, with a view to finding the one best adapted to their work to replace their own plain wheels, found none entirely satisfactory, and made an effort to design one better adapted to their needs. Several designs were constructed, and the best improved, as experience in their use suggested, until perfected and adopted as their standard. This pattern has since been adopted at all the Pennsylvania Railroad Company's and several individual anthracite collieries, to replace their old patterns as rapidly as possible.

The first made have been in use nearly a year, and are giving entire satisfaction, not only on account of the oil and labor saved in lubricating and the power saved in haulage, but also on account of the advantages incident to the easy and uniform running of the cars on grades suitable for handling them by gravity, which cannot be done satisfactorily with cars that are badly lubricated and will not run uniformly on grades. These wheels are readily adaptable to all cars arranged for outside wheels. They are economically and substantially constructed at about ten per cent. above the cost of common plain wheels by the Bloomsburg Car Company of Bloomsburg, Pa., and others. They completely exclude dust and grit from the bearings, and thoroughly lubricate them at all speeds without waste and with less than one per cent. of the oil usually used.

One oiling of a third of a pint of black car oil will properly lubricate a wheel as usually run on mine cars for three to four months, and they can readily be arranged, if desired, for a larger quantity of oil and longer periods of running, or for oiling while in motion.

Frictional tests have shown that these new wheels with their clean and properly lubricated bearings give but about two-thirds of the frictional resistance that common wheels have, with their dirty and gritty bearings, even when in a well oiled condition, and as this cannot be maintained on long runs their friction then proportionally increases. In practice it is found that greater power is required to pull two cars with the plain, common wheels than to pull three cars with these new wheels, on levels and on slight grades.

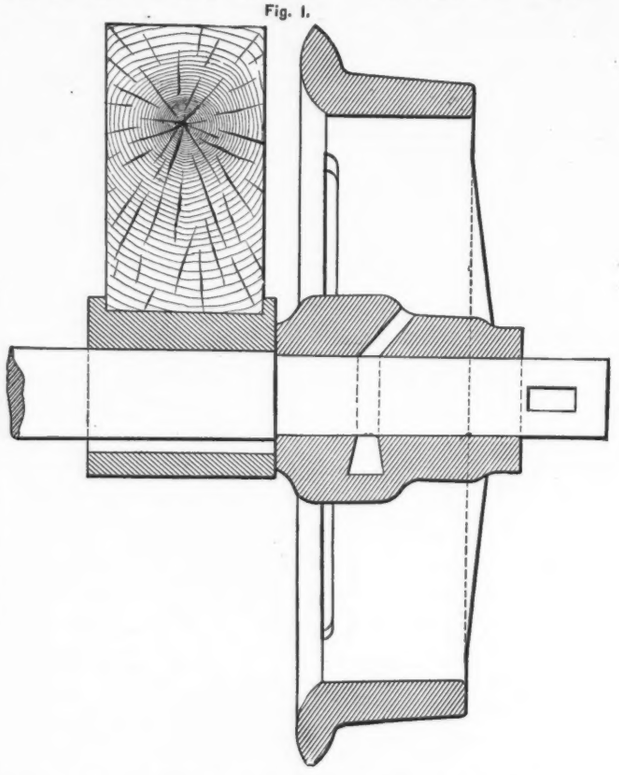
In this new wheel bearing the lubrication is automatically effected by centrifugal action upon the oil in the reservoir at the closed end of the hub, causing it to flow through ports into spiral, zigzag channels leading it radially toward the axle, positively and continuously supplying the bearing with oil along its length and returning the surplus through the return spirals to the reservoir, the faster the speed in either direction the larger the quantity of lubricant applied. The liability of the oil channels and passages to become clogged by the accumulation of detritus or gummy oil is reduced to a minimum by the circulatory current, from the reservoir to the axle and return, through large free openings, from which all sand and grit are readily removed before use, and any accumulation from bad oil which might afterwards occur; the zigzag passages in the bore being open their entire length to the channels and all cored openings being readily accessible from the bore.

This bearing is also applied to loose wheels and pulleys on shafts under Patent No. 419,494, issued Jan. 14, 1890, to J. H. Bowden.

The following is an extract from the report of Mine Inspector G. M. Williams, of Pennsylvania, which deals with the subject:

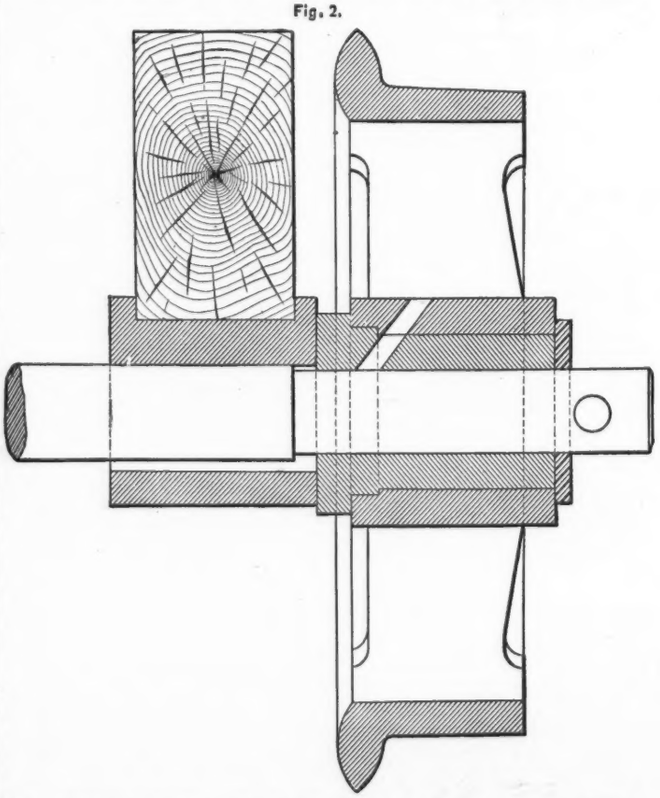
"In view of the great improvements that have been made in anthracite preparing, hoisting, pumping, ventilating and general mining ma-

Fig. 1.



chinery, it is surprising that so little attention has been given and so little advance made in improving the construction of mine cars and their running gear with a view of economizing labor. A man's power for producing work is limited, like that of a steam engine; so is the power of an animal. The unit of work is that which will raise a weight of one pound

Fig. 2.



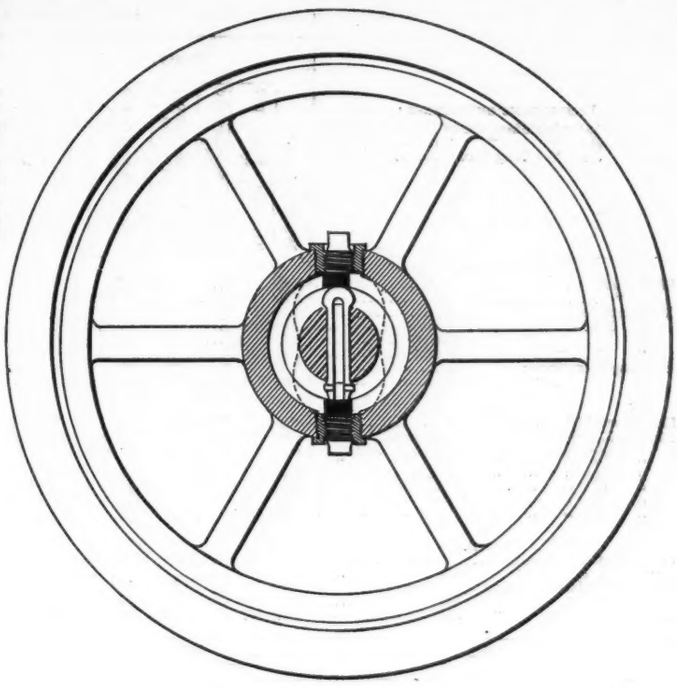
to the height of one foot. Therefore, the units of work performed may be calculated by multiplying the weight raised in pounds by the height in feet.

A miner's laborer performs much work in preparing and cleaning the coal ready for loading into the cars, and, with our present knowledge, we

see no way of avoiding any portion of that part of his labor; but much of the labor now expended in loading the coal into the mine cars could be saved by changing the construction of the cars and of the car wheels. To illustrate this I will compare the labor expended per day in loading 14 tons into two different cars at two different mines. A miner's laborer loads about this quantity for every full day's work.

One of these cars is constructed to carry two and one-third tons, and is not over three feet six inches high from the floor of the coal seam; the other car, while carrying only the same quantity of coal, is four feet eight inches high. Thus, in loading 14 tons into a car of the latter description, the laborer has to perform work equal to that necessary to raise 14 tons to a height of one foot two inches in excess of the work required in loading the same quantity into a car of the first description, and that for the same result. To illustrate this further we will say that 14 tons are loaded into six mine cars in each of the mines, and that half

Fig. 3.



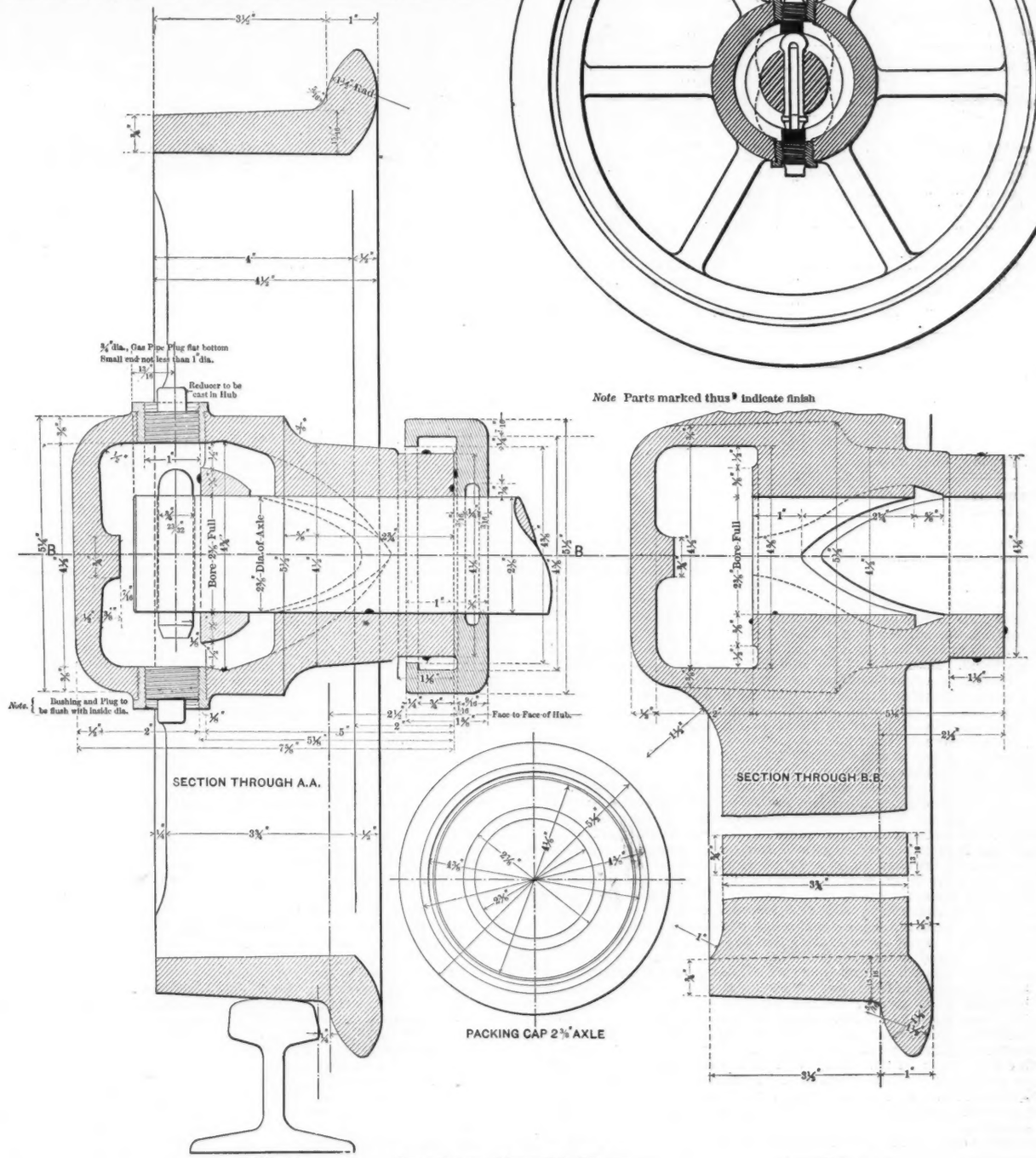

Note Parts marked thus ' indicate finish
Reducer to be cast in Hub
Bore 2⅝" Full
2¾" Dia. of Axle
Bushing and Plug to be flush with inside dia.
Face to Face of Hub.
SECTION THROUGH A.A.
SECTION THROUGH B.B.
PACKING CAP 2⅜" AXLE

Fig. 4. SELF-OILING MINE CAR WHEEL. Fig. 5.

an hour of time is taken to load each one in the mine where the car three and one-half feet is used, then three hours of each day is passing during the actual loading of 14 tons into six mine cars, and 109,760 foot pounds or units of work are expended in the three hours, or at the rate of 36,586 foot pounds per hour, this being the work expended each day by the laborer in the actual loading of coal.

In the other mine, to load the same quantity of coal in a car four feet eight inches high, 146,347 foot pounds or units of work must be expended, or a difference of 36,587 foot pounds being one hour's work at the above rate; or, in other words, a laborer can load fourteen tons of coal into the low car in three hours, while it would require four hours to load the same quantity into the high car, working at the same rate.

In a mine employing 100 laborers, and on the assumption that eight hours out of a working day of ten hours are occupied in actual work, the 100 laborers in the mine where the low car is used produce as much as 112 in the other, an item which is of value and worth saving. Besides, a man can raise heavy lumps of coal to a height of three and one-half feet with less fatigue in proportion to the quantity of work performed than where he has to raise them to a height of four feet eight inches.

SUMMARY OF FRICTION TESTS SUSQUEHANNA COAL COMPANY'S MINE CARS, APRIL, 1889.

DIMENSIONS OF WHEELS: 16 inches diameter of tread. 2⅛ " " " axle. 5¼ " length of journal.	OLD-STYLE WHEELS. Empty. Weight of car.	Tractive force per car.	Tractive force due to gravity.	Tractive force per car due to friction.	Tractive force per ton due to friction.	Percentage of weight.	Loaded. Weight of car.	Tractive force per car.	Tractive force due to gravity.	Tractive force per car due to friction.	Tractive force per ton due to friction.	Percentage of weight.	NEW-STYLE WHEELS. Empty. Weight of car.	Tractive force per car.	Tractive force due to gravity.	Tractive force per car due to friction.	Tractive force per ton due to friction.	Percentage of weight.	Loaded. Weight of car.	Tractive force per car.	Tractive force due to gravity.	Tractive force per car due to friction.	Tractive force per ton due to friction.	Percentage of weight.
LEVEL.																								
Slow start	2240	100	....	100	100	4.46	8500	325	....	325	85	3.80	2415	66⅔	....	66⅔	62	2.78	9125	200	....	200	49	2.20
" "	2140	83	....	83	86 9-10	3.88	7885	357	....	357	101 4-10	4.53	2415	62	....	62	55 6-10	2.48	8160	193	....	193	53	2.36
Motion 50 feet per minute	2140	54	....	54	56 6-10	2.52	7885	205	....	205	58 3-10	2.60	2415	40	....	40	37 1-10	1.66	8160	133	....	133	36 5-10	1.63
" 1,000 feet per minute 1 car	2140	62	....	62	64 9-10	2.89	7885	262	....	262	74 4-10	3.32	2415	36⅔	....	36⅔	33 9-10	1.48	8160	158	....	158	43 3-10	1.93
" " " " " 4 cars	2240	62½	....	62½	62½	2.80	.....	.....	.....	.....	.....	.....	2415	37½	....	37½	34 3-4	1.56	.....	.....	.....	.....	.....	.....
" " " " " 20 cars	2240	47	....	47	47	2.20	9000	117	....	117	29	1.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Starting jerk, 20 cars	2240	96	....	96	96	4.29	9000	175	....	175	44	1.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " 2 " rope haul	2240	630	....	630	630	28.12	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
GRADE.																								
Slow start, 12 degrees	2140	550	445	105	110	4.90	7885	1950	1639	311	88 4-10	3.94	2415	600	502	98	90 9-10	4.06	8160	2000	1696	304	83 5-10	3.73
Motion 50 feet per minute, 12 degrees	2140	510	445	65	68	3.18	7885	1800	1639	161	45 8-10	2.00	2415	540	502	38	35 1-10	1.56	8160	1825	1696	129	35 8-10	1.58
" 1,000 feet per minute, 1¾ degrees, 1 car	2140	125	65	60	62 8-10	2.80	.....	.....	.....	.....	.....	.....	2415	100	73	27	25	1.12	8160	400	249	151	41 5-10	1.85
" " " " " 1½ " 1 "	.....	.....	.....	.....	.....	.....	7885	425	205	220	62 5-10	2.79	.....	.....	.....	.....	.....	.....	8160	350	212	138	37 9-10	1.69
" 200 " " " rope haul 2 degrees.	2240	140	78	62	62	2.80	Cars pulled from side.																	
" " " " " " " 2 deg. 30 ft.	2240	183	98	85	85	3.80																		
" " " " " " " 5 " 10 "	2240	315	202	113	113	5.00																		
" " " " " " " 6 " 10 "	2240	353	240	113	113	5.00																		
CURVE.																								
Slow start 85 feet radius	2240	125	....	125	125	5.58	8500	400	....	400	106	4.70	....	....	....	....	.....	.....	9125	275	....	275	67	3.00
4 " " 11 " " 1½ degrees grade	.....	.....	.....	.....	.....	.....	8700	592	227	819	152	6.80	....	....	....	....	.....	.....	9125	564	239	325	80	3.60
20 cars 1,000 feet per minute, 350 feet radius	2240	62	....	62	62	2.80	9000	143	....	143	36	1.60	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....
" " " " " " 450 " "	2240	50	....	50	50	2.23	9000	126	....	126	32	1.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20 " " " " " 350 " "	2240	100	...	100	100	4.46	.....	.....	.....	.....	.....	.....	2415	75	....	75	70	3.10	.....	.....	.....	.....	.....	.....

COMPARISON OF RUNNING FRICTION OF CARS WITH OLD AND NEW STYLE WHEELS ON STRAIGHT ROAD, LEVEL AND GRADE UNDER SIMILAR CONDITIONS. AVERAGE OF 807 TESTS.

	Percentage of weight. Old style.	New style.	Difference.	Comparison of friction. Old style %.	New style %.	Difference %.	Average per 100 pounds. Old.	New.
Speed 50 feet per minute	2.57	1.61	0.96	100	62 6 10	37 4-10	100	60
Speed 1,000 feet per minute	2.92	1.68	1.28	100	57 5-10	42 5-10	166⅔	100

J. H. BOWDEN, Chief Engineer. Tests made by R. VAN H. NORRIS, E. M., Assistant Engineer.

Cars constructed on the pattern of ordinary railroad cars having the wheels inside the journals are unavoidably high because the bottom must be raised above the wheels, while those having the wheels outside the journals can be constructed having the bottoms of the cars resting on the axles, and thus a reduction in height equal to half the diameter of the wheels is effected. Much of the power expended in the haulage of the cars might also be saved if closer attention were given to a proper construction of the wheels, with a view of providing more perfect means of lubrication. Mine car wheels which rotate on the overnecks of the axles, outside the sill bearings, almost universally have simply a hole in the hub, into or at which oil is poured at intervals, and oil thus applied is mostly wasted. Both ends of the hub being open, it drips off along the tracks, causing a very inflammable material to be still more ready to take fire, to the detriment and danger of both life and property. This kind of wheels allows dirt, grit, mud and water to enter the bearings, so that it becomes impossible to lubricate them as they should be lubricated for long runs, consequently the wheels and axles are soon destroyed, and much of the hauling power is unnecessarily wasted.

Recently efforts have been made to overcome these disadvantages by the use of self-oiling wheels, and the Susquehanna Coal Company, after making a series of elaborate tests, the results of which are presented in the accompanying table, decided to use a wheel of the following description, an improvement effected by their Chief Engineer J. H. Bowden.

The wheel is 16 inches in diameter of tread, mounted on a plain 2¼-inch steel axle, and fastened in place by a spring, or other linch pin passed through the holes in the hub. The hub of the wheel is cast closed at the outer end to form an oil chamber, to which is provided two one-inch holes, closed by taper plugs, for the entrance of the linch pin and lubricant; the oil is prevented from escaping through the end where the axle enters the hub either by a cap closely fitting the axle and extending over the end of the hub, and having the space between it and the hub closed by a packing ring as shown on Fig. 1, or by a collar on the axle fitting closely the axle and packed in the recess at the end of the hub, as shown in Fig. 2. In flexibly built cars the said cap is cast in one piece with the box, but in rigidly built cars it is cast separate, and the hole in the box is oval, as shown, to give the wheels vertical play so as to permit of their keeping on the rail when running on uneven tracks.

The oil chamber in the closed end of the hub is connected with a groove cast in the hub, running spirally around the axle, and open to it, as shown in Figs. 1 and 2, by port holes opening from the oil chamber away from the axle, as shown in Fig. 3; thus a continuous ring of metal is left as a bearing for the linch pin.

One oiling of the wheel lasts from two to four months, varying with the quality of the lubricant used and the distance run by the cars. By the use of a hollow axle or by enlarging the oil receptacle in the wheel, the length of running time without renewal of the lubricant can be indefinitely increased.

The superiority of this wheel over the old ones is clearly shown in the accompanying table of comparative tests made, in order to determine their relative fractional resistance, and to show the difference in the decrease of friction effected by the use of these new self-oiling wheels.

Comparing this new wheel as manufactured by the Bloomsburg Car Company of Bloomsburg, Pa., with the old style loose wheels when freshly oiled and under favorable conditions, a difference of 40 per cent. was found in the pull required to move a given load in favor of the new wheel, *i. e.*, where a pull of 100 pounds sufficed to move a load with the new wheel it required a pull of 167 pounds to move an equal load where the old style wheels were used. Thus a saving of one-third the hauling power, of a number of driver boys, and of a large proportion of the lubricating oil, is effected by its use. All devices which contribute toward reducing the number of persons employed in any branch of work, without decreasing the production, contribute also to decrease the number of accidents.

Car wheels 16 to 18 inches in diameter are considered the best for all practical purposes in mines: if made smaller or of less diameter they require greater hauling power to move the loads and consequently greater expense in the haulage; if of larger diameter, the car is raised too high for easy loading and for passing through the passages at many points in the mines without breaking into the roof by blasting it down, which is expensive and undesirable.

Low, easy-moving mine cars are desirable because they are safer and more economical, requiring a less number of persons and less power to move them; they are safer because the drivers can get on and off with ease and less liability to being caught between them and the roof of the mine.

On runs and inclined roads well-lubricated and easy-running cars are less liable to "runaways," because the runners can more accurately determine the number of sprags required in the wheels.

In a paper by R. A. Van Norris, of Wilkesbarre, Pa., read before the American Institute of Mining Engineers, at Washington, in February, the following description is given of the tests for the Susquehanna Coal Company to determine the relative efficiency of several styles of car wheels:

Fig. 1 shows a section of a plain cast wheel, with patent annular oil-chamber. This is held in position on the axle by a square, split cotter-pin. Fig. 2 is a similar wheel, with a patent cast bushing, which is readily replaced when worn. The lubrication is effected by a simple oil-hole, but the oil is delivered a little inside of the gauge-line of the wheel, where it is most needed. Figs. 3, 4 and 5 are sections of a "new style" patented, self-oiling wheel. In this the outer end is cast closed, and the wheel is fastened to the axle by a spring cotter-pin passed through one of the plugged holes. Dirt is prevented from entering the open end by a cap, with faced end and packing-ring, fitting over the end of the hub. The lubricant is introduced into the oil-chamber through one of the plugged holes in the hub.

All the wheels are of the loose outside type, 16 inches in diameter, mounted on 2¼-inch steel axles, with journals 5¼ inches long. The axles pass loosely through solid cast boxes, bolted to the bottom sills of the cars, and are not expected to revolve.

Tests were made on the starting and running friction of each style of wheel, under the conditions of empty and loaded cars, level and grade track, curves and tangents. The instruments used were a Pennsylvania Railroad spring dynamometer, graduated to 3,000 pounds, with a sliding recorder, a hydraulic gauge (not recording) reading to 10,000 pounds, graduated to 25 pounds, and a spring balance, capacity 300 pounds, graduated to 3 pounds. All these were tested and found correct previous to the experiments.

Most of the observations on single cars were made with the 300-pound balance. The two types of "old style" wheels were found to give results so nearly alike that they have been classed together in the table. Each car was carefully oiled before testing, and several of each type were used, the results averages from the number of trials being shown in the table.

In the experiments upon slow start and motion, the cars were started very slowly by a block and tackle, and the reading was taken at the moment of starting. They were then kept just moving along the track for a considerable distance, and the average tractive force was noted—the whole constituting one experiment.

The track selected for these experiments was a perfectly straight and level piece of 42 inches gauge, about 200 feet long, in rather better condition than the average mine track. The cars were 41¼ inches gauge, 3½ feet wheel-base, 10 feet long, capacity about 85 cubic feet, with 6-inch topping.

To ascertain the tractive force required at higher speeds, trips of one, four and twenty cars, both empty and loaded, were attached to a mine locomotive and run about a mile for each test, the resistance at various points on the track, where its curve and grade were known, being noted, and care being taken to run at a constant speed. Unfortunately, only four of the "new style" cars were available on the tracks where these trials were made.

The remarkably low results for the 20-car trips are attributed to variations in the condition of the track, and the fact that the whole train was seldom pulling directly on the locomotive, the cars moving by jerks, so that correct observations were impracticable. The hydraulic gauge was used for these 20-car tests, and the needle showed vibrations from one to four tons and back. The mean was taken as nearly as possible. The gauge was rather too quickly sensitive for the work, and the Pennsylvania Railroad dynamometer was not strong enough to stand the starting jerks and the strain of accelerating speed.

The tests marked "rope-haul" were made on an empty-car haulage-system, about 500 feet long, with overhead endless rope running continuously at a speed of 180 feet per minute, the cars being attached to the moving rope by a chain, a ring at the end of which was slipped over a pin on the side of the car. The increase of friction on the heavier grades was due to the rope pulling at a greater angle across the car.

REPORT OF THE STATE GEOLOGIST OF MISSOURI.

The following is a statement by Arthur Winslow, State Geologist of Missouri, of the operations of the Geological Survey during the month of May:

The detailed mapping of the coal fields has progressed with little interruption. Field work has now been extended over nearly 400 square miles, and the results have been plotted on to the preliminary sheets, and are now being transferred to the final sheets.

Mr. Gilber Van Ingen is detailed by the United States Geological Survey to assist in palaeontologic work in this State. He has been at work during the greater part of the past month in Pettis county. Detailed mapping was prosecuted during the early part of the month in southeast Missouri, and about 70 square miles have been covered.

Work on the building materials and clays of St. Louis has been vigorously pushed during the latter half of the month. Along with a study of the origin and distribution of the clay deposits, and of the economically important limestones, inquiry has been made into the nature and extent of the dependent industries. About two-thirds of the stone quarries have been visited and nearly all of the clay works. An idea of the magnitude of the interests involved may be gathered from the following approximate statement of the number of works in and about St. Louis:

Eight fire brick and sewer pipe manufacturers; 40 common and pressed brick manufacturers; six potteries; one terra cotta manufacturer; two terra cotta lumber manufacturers; 40 stone quarries.

The value of the annual output of the clay industries is at present in the vicinity of $3,000,000, and that of the stone quarries cannot fall far short of $1,000,000.

In the laboratory nearly all of the samples of mineral waters collected during April have been analyzed, and the results will soon be ready for publication. In addition, some 17 lots of specimens sent in by outside parties have been identified and reported upon, and a few analyses of coal and iron ores for survey purposes have been made.

Preliminary inspections have been made in Platte, Clinton, Crawford and Morgan counties. In Platte and Clinton counties are coal beds of economic value, but its mineral waters and clays also deserve attention. There is every probability that the 22-inch coal bed, mined at different points in the vicinity of Leavenworth, Kan., (as well as others found at different depths) extends under these counties. Its depth below the surface at Leavenworth is about 700 feet; but eastward, into Missouri, it must rise progressively towards the surface. The exact determination of these points, as well as the definition of the limits of the bed, cannot be made until systematic and detailed work is done in these counties. In view of the extensive development of the coal industry at Leavenworth close to the Missouri line, and in view of the probable establishment in the future of a similar industry in Missouri near the Kansas line, provisions should be made in the near future whereby encroachment of mining operations from a property in one State upon a property in the other State should be prevented.

In Crawford county iron ore still occupies a prominent place among its mineral products. Some of the deposits of this ore are, however, exhausted, and others are approaching that condition. The demand will before very long be urgent for new sources of supply. The conditions are such, in this and adjoining counties, as to justify the expectation that systematic and thorough geologic work may lead to the discovery of other deposits, and it is the intention to institute such work as soon as the means and the demands upon the force of the survey will permit. Operations looking to the development of zinc and lead mining are also in progress here.

In Morgan county there are prospects of a revival in lead mining, and this in a more thorough manner than has been the case in past years. A profitable industry may be built up here if the developments are made cautiously and under competent direction, such as will lead to a knowledge of the origin of the ore and such as will guide one in selecting localities for prospecting. The survey is not, at present, in a position to give specific advice on such matters, however, and cannot do so until detailed local work is finished. Zinc mining is also being started in this county, notably at the Big Three shaft, about five miles southwest of Versailles. Concerning the coal deposits of this county mention will be made in a future report.

SOCIETIES.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The following additional papers are announced for presentation at the annual convention of 1890, reported to in our last issue.

The three river spans of the bridge recently completed across the Ohio River at Cincinnati: William H. Burr. The beginnings of Engineering with special reference to early Engineering Science in America: J. Elfreth Watkins. On Truss Bridges: Onward Bates. One way of obtaining Brine: Charles B. Brush. The Self-registry of Effects of Strain in Metals: Robert H. Thurston. Comparison of Water Supply Systems from a Financial point of view: J. Leland Fitz Gerald.

Canadian Bounty on Pig Iron.—The Dominion Parliament has agreed to a proposal submitted by the Government for an increase in the bounties that are at present paid upon pig iron manufactured in Canada, with a view to further encourage the industry. In 1883 a bounty of $1.50 per ton (of 2,000 pounds) was granted for three years, and $1 per ton for another three years afterward. The bounty of $1.50 was, however, renewed in 1886, the $1 per ton being made to apply from 1889 to 1892. Under the new arrangement the present bounty will continue until 1892, but from that year it will be increased to $2 per ton for a period of years.

How to Make a Good Hone.—In describing a method of making a stone for sharpening tools, a contemporary says: "Take gelatine of a very good quality, which melts in an equal quantity of water. The operation should be performed in darkness, as daylight is injurious to gelatine. When melted add 1½ per cent. of bi-carbonate of potash previously dissolved. Then take about nine times, by weight, the quantity of gelatine employed of very fine emery and pulverized flint stone, which mix intimately with the dissolved gelatine. Mold the obtained paste according to the desired form, and press it in as hard as possible to consolidate the mass well. After it has been dried in the sun the result will be a first-class stone for sharpening."

A Dwelling House Elevator.—A Berlin inventor has proposed "a simple and inexpensive elevator for private dwellings," which he describes as follows: It is on the principle of an inclined railway, and the motive power is furnished by the city water, which is applied in the cellar; each flight has its separate chair, so that, for example, one person can ascend from the first to the second story while another is on his way from the second to the third, or still another is descending from the fifth to the fourth. The chair, being only the width of the human body, requires but little space, and still leaves a free passage for any who wish to walk up or down instead of riding. It is set in motion by a simple pressure upon one of its arms, while after it has been used it slides back to the bottom step, its descent being regulated in such a manner that the carrying of a passenger is a matter of entire safety. The motive power is, of course, more or less expensive according to the cost of water, the rate in Berlin is stated to be a little more than one-tenth of a cent only for each trip.—*The Building News.*

Storage of Petroleum.—In Aarhus, Jutland, the Danish Petroleum Company has built a reservoir for the storage of petroleum, with a capacity of about 16,000 barrels petroleum, which corresponds with the size of the tank steamers in use there. The reservoir consists of heavy plate iron, riveted together on the spot. Form the reservoir an underground pipe, about 5,000 ft. long, leads to the harbor. This pipe consists of 6-in. steel pipes screwed together. From the reservoir the petroleum is again led down to a small house, where the "barreling" takes place. Six barrels can be filled at a time, and when full the tops are automatically closed. In a second house are the workshops for repairs of barrels, etc., and in a third boiler: and engine house a second reservoir with about 13,000 barrels' capacity will be shortly commenced. It was intended to have the establishment lighted by electricity, but the authorities have forbidden this. An earthen rampart surrounds the whole establishment. Of the reservoirs on the island of Refshale in the Copenhagen harbor, one is for account of the Nobel firm and another for American petroleum.

Compressed Air Lifts in Paris.—Compressed air is being applied to machinery in Paris upon the Popp system with conspicuous success. The Parisian Compressed Air Company has just introduced a lift having this motive power, and it is being tried at the Bourse du Commerce, and at one or two of the principal hotels. Its main recommendation is that the cost is about one-half that of hydraulic lifts, and that the expense of working is proportionate to the weight of material raised. The principle of the lift is very simple. The lift is worked by compressed air, which operates upon water. When the compressed air is admitted, it enters a water chamber. The water in the chamber is forced out under the lift ram or piston, which is driven upwards. On the descent of the lift the water flows back again into the chamber, so that the action is very easy and gradual. By this method the power exerted can be regulated at will, and the lifts now in use in Paris are employed both for lifting persons and for raising machinery and similar heavy goods. The same company has also laid down an installation in the Bourse du Commerce for refrigerating purposes, the air being maintained at a low temperature by expansion of compressed air.

Dissolution of Copper in Acids.—In a chemical society paper on "The Rate of Dissolution of Metals in Acids," Mr. V. H. Veley said the dissolution of copper in a solution of potassium bichromate acidified with sulphuric acid was investigated as affording a case in which no gas was evolved as such. The copper was employed in the form of metallic spheres, which by various mechanical devices were rolled about continuously and regularly in the acid liquid, and the products of the changes continuously removed from the immediate neighborhood of the metal. The author finds (1) that if the temperature be varied between 21 degrees and 41 degrees in an arithmetical proportion, the amount of chemical action varies in a geometrical proportion; (2) that if the amount of sulphuric acid be varied in an arithmetical proportion between the limits of 41·3 and 23·5 grammes per litre, the amount of change also varies in an arithmetical proportion: and (3) that the amount of change is at first considerably increased by increase of proportion of potassium bichromate, but the effect afterward gradually diminishes to *nil*, at which point the bichromate can be considered to be so much inert material; the amounts used varied from 22·1 to 66·3 grammes per litre.

Riley's Nickel Steel Patent.—J. Riley, Glasgow, has taken out patent No. 8,492, May 22d, 1889, for improved steel or steel-like compounds which are manufactured in a crucible, Bessemer converter, or open hearth furnace, but preferably in the latter. When using a crucible, nickel is added in the form of bars, cakes, or granular pieces mixed with iron or steel scrap. When the contents are melted, a proportion of ferro-manganese is added, and finally some metallic aluminum. In a converter the charge of metal is decarbonized to the required extent, and sufficient ferro-manganese added to insure deoxidation, and then nickel; subsequently ferro-manganese is added, and immediately after aluminum or its alloy. The method of proceeding with an open-hearth furnace is that usually adopted in the manufacture of steel until a proper degree of decarbonization of the charge has been reached, when a sufficient quantity of ferro-manganese is added to insure deoxidation. Next nickel is added, and then again ferro-manganese, and finally aluminum or its alloy. Instead of introducing nickel alone, a compound of nickel, copper, and iron may be used, and preferably the compound produced as a matte in the primary smelting of ores. Four claims are made for the above-described methods of making steel or steel-like compounds.

Production of Coal in India in 1889.—According to a recent official return, there were raised in India last year upwards of 1,750,000 tons of coal as compared with 1,709,000 tons in 1888, 1,563,652 tons in 1887, and 1,389,000 tons in 1886. These figures show that the output of coal from the Indian collieries is growing year by year, and this, too, despite the fact that many of the collieries opened out have been closed, their working involving a loss. The total number of coal mines in India is 117, but only 67 are actually at work. In Bengal alone there are as many as 107 collieries, the rest being situated in Central India and Assam. These employ a daily average of 25,000 hands. During the ten years ending 1888 the output of Indian coal more than doubled, and during the next ten years the increase will probably be still more rapid. Upper Burmah possesses on the Chindwin river coal measures of great extent and value, and may be expected before long to add considerably to the supply. Up to the present, we believe, no coal mines have been uncovered in the Bombay Presidency, where all the mills and workshops, and even the railways on the western side, are almost entirely dependent upon England for their supplies. It seems strange that this should be so, but the sole reason for it is affirmed to be the high railway rates, which do not allow of coals being brought from Bengal into the adjoining Presidency at a profit.

The Electrical Plant of India.—There has been discovered in the forests of India a strange plant which possesses to a very high degree astonishing magnetic power. The hand which breaks a leaf from it receives immediately a shock equal to that which is produced by the conductor of an induction coil. At a distance of six meters a magnetic needle is affected by it, and it will be quite deranged if brought near. The energy of this singular influence varies with the hour of the day. It is all powerful about two o'clock in the afternoon, but is annulled during the night. At times of storm its intensity augments to striking proportions. During rain the plant seems to succumb and bends its head during a thunder shower; it remains there without force or virtue, even if one should shelter it with an umbrella. No shock is felt at that time in breaking the leaves, and the needle is unaffected beside it. One never by any chance sees a bird or insect alight on the electric plant; an instinct seems to warn them that they would find sudden death. It is also important to remark that where it grows none of the magnetic metals are found; neither iron, nor cobalt, nor nickel, an undeniable proof that the electric force belongs exclusively to the plant. Light and heat, phosphorescence, magnetism, electricity—how many mysteries and botanical problems does this wondrous plant conceal within its leaf and flower.

A Hint to Stove and Furnace Makers.—For some years past American stoves and furnaces have enjoyed a wide popularity on the continent of Europe. Their graceful construction, effectiveness as fuel economizers and low cost have especially captured the thrifty German people. American-made stoves, certainly superior to the English and Irish-made stoves, have undersold them in the German markets, mainly because of the superior facilities and contrivances adopted in manufacture in this country. But the German objects to importing what he can make himself. Stove factories are therefore springing up all over, and more especially in the vicinity of Mannheim, where so-called "American stoves" are being turned out rapidly.

The result of this has already appreciably affected the exportation of American stoves to Germany. And it may be depended upon that, as soon as the Germans perfect their mechanism and methods, and with cheap labor, they will become formidable competitors in our outside markets. In all the republics of South America, more especially, the Germans are now pushing their products, and in some cases they are even crowding the English. As our Teuton competitors waste little time in commercial matters, it behooves American stove manufacturers to watch their South American markets. Eternal vigilance and goaheaditiveness are the price of commercial supremacy.

Colored Films on Metals.—The small metallic articles, such as buttons, buckles, clasps, etc., have different colored films produced on them by various methods. Some of these are known as oxidized silver.

Rainbow colors are produced on brass buttons by stringing them on a copper wire by the eyes, and dipping them in a bath of plumbate of soda freshly prepared by boiling litharge in caustic soda, and pouring it into a porcelain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in the solution, so as to keep up the original strength of the solution. While the buttons are in this solution, they are touched one after the other with a platinum wire connected with the positive pole of a battery until the desired color appears. The galvanic current employed must not be too strong. The colors are more brilliant if they are heated after they have been rinsed and dried.

Colored films are more conveniently produced upon bright brass by different chemicals, by painting with them, or by immersion. For example:

Golden yellow.—By dipping in a perfectly neutral solution of acetate of copper.

Dull grayish green.—Repeatedly painting with very dilute solution of chloride of copper.

Purple.—Heating them hot and rubbing over with a tuft of cotton saturated with chloride of antimony.

Golden red.—A paste of four parts of prepared chalk and of mosaic gold.

In covering an article with any colored bronze in powder, it is first rubbed with a very little linseed oil, and the bronze dusted evenly over it from a dust bag. It is afterward heated in an iron pan to about 480 degrees Fahrenheit.

In recent times small articles are also roughened by dipping in strong nitric acid, and, after washing and drying, they are coated with a rapidly drying alcohol varnish that has been colored yellow with picric acid, red with fuchsine, purple with methyl violet, or dark blue with an aniline blue. This gives the desired color with a beautiful metallic lustre. The latter colors are not very durable and are for inferior goods.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

PATENTS GRANTED TUESDAY, JUNE 10TH, 1890.

429,592. Apparatus for Projecting Combustible Missiles. George H. Babcock, Plainfield, N. J.

429,594. 429,594. Pneumatic cannon and method of operating the same. Wallace A. Bartlett, Washington, D. C., Assignor, by mesne assignments, to the Pneumatic Dynamite Gun Company, New York, N. Y.

429,595. Pneumatic Cannon. Wallace A. Bartlett, Washington, D. C., Assignor, by mesne assignments, to the Pneumatic Dynamite Gun Company, New York, N. Y.

429,597, 429,598. Means for Igniting Fuses without exposing Flame or Sparks. William B. Smith, Helston, and George J. Smith, Truro, County of Cornwall, England.

429,600. Hydraulic Motor. James W. Blakemore, Philadelphia, Pa.

429,607. Metal Railway-Sleeper. Charles Delorme and Emil Brochon, Troyes, France.

429,613. Sleeper for Railways. Samson Fox, Leeds, County of York, England.

429,623. Rolling Mill for Making Seamless Tubes. William Heckert, Findlay, Ohio.

429,625. Apparatus for Grinding Wet Materials. Joseph Hoffman, Hoboken, N. J.

429,626. Furnace. William Horsfall, Leeds, County of York, England, Assignor to William Garlick, Jr., and William Browne Colville, both of Calcutta, India.

429,628. Plate or Connector for connecting Railroad Joints. John G. Hunlock, Wyoming, Pa.

429,638. Process of manufacturing Iron and Steel. Jacob Reese, Pittsburg, Assignor to the Bessemer Steel Company [Limited], Philadelphia, Pa.

429,641. Pneumatic Cannon. George H. Reynolds, New York, N. Y., Assignor to the Pneumatic Dynamite Gun Company, same place.

429,648. Traction Engine. Benjamin F. Sammons, Sumner, Mo.

429,656. Stuffing Box for Piston Rods. John F. Snyder, Roanoke, Ill.

429,656. Enamel for Coating Bricks. Joseph Stiel, Cologne, Germany.

429,662. Car Coupling. Marshal E. Summers, Guilford, Mo.

429,664. Apparatus for Regulating Hydraulic Power. Robert H. Thorpe, London, England.

429,666 and 429,667. Hydraulic Press. Samuel J. Webb, Minden, La.

429,675. Apparatus for Generating Oil Gas. Martin C. Burt, Chicago, Ill.

429,682. Apparatus for Treating Charcoal. Richard V. F. Guinon, Brooklyn, N. Y.

429,725. Hot-blast Stove. Hugh Kennedy, Sharpsburg, Pa.

429,730 and 429,731. Electric Drill System. Harry N. Marvin, Syracuse, N. Y.

429,732. Generator for Electrically Reciprocated Tools. Harry N. Marvin, Syracuse, N. Y.

429,744. Process for Manufacturing Iron or Steel. Asahel J. Severance, New York, N. Y., Assignor of one-half to John D. Brown, same place, and Winfield M. Clark, Albany, N. Y.

429,746. Electric Railway Motor Truck. Charles J. Van Depoele, Lynn, Mass.

429,755. Oil Burner. Nathan S. Clement, Florence, Mass.

429,758. Rail Joint. Joseph D. Greene, Marshall, Mo.

429,744. Utilizing Exhaust. Wilhelm Schmidt, Halberstadt, Prussia, Germany.

429,755. Art of Annealing Steel Castings and Steel Forgings. William Sellers, Philadelphia, Pa., Assignor to the Edge Moor Iron Company, of Delaware.

429,776. Furnace for Heating Metals. William Sellers, Philadelphia, Pa., Assignor to the Edge Moor Iron Company, of Delaware.

422,777. Welding Compound. Asahel J. Severance, New York, N. Y., Assignor of one-half to John D. Brown, same place, and Winfield M. Clark, Albany, N. Y.

429,780. Water Wheel. James L. Shelton, Inez, Va.

429,797. Furnace Grate. William R. Roney, Chicago, Ill., Assignor to Westinghouse, Church, Kerr & Co., of New York, N. Y.

429,801. Traction Motor. James S. Baldwin, Newark, N. J., Assignor to Samuel H. Baldwin, same place.

429,808. Condenser for Steam Pumps. Richard L. Frost, Battle Creek, Mich., Assignor to the Union Manufacturing Company, same place.

429,823. Amalgamator. Charles W. Tremain, Portland, Ore., Assignor to the Prospective Mining and Machinery Company, of Oregon.

429,840. Coal Chute. Washington Claypoole, Philadelphia, Pa.

429,844. Pipe. John P. Culver, Los Angeles, Cal.

429,857. Ore Feeder. Edward C. Loftus and Edgar H. Booth, San Francisco, Cal.

429,866. Machine for grinding and polishing stone. John McEnerney, New York, N. Y., Assignor to the American Granite Company, same place.

429,868. Railway Track Rail. Eugene Robinson, Detroit, Mich.

429,874. Stone Sawing Machine. George N. Williams, Jr., Mount Vernon, Assignor to B. A. & G. N. Williams, Jr., New York, N. Y.

429,886. Car Coupling. Milo M. Clarke, Westerly, R. I.

429,892. Process of preventing the oxidation and deoxidation of copper when heated. George W. Cummins, Vienna, N. J.

429,900. Steam and Gas Generator. Leander E. Fish, Los Angeles, Cal.

429,909. Separating Machine. August Heine and Newton B. Trask, Silver Creek, N. Y., said Trask assignor to said Heine.

429,920. Car Coupling. Albert N. Hopkins, Duluth, Minn.

429,947. Cement Lined Pipe. Henry B. Nichols, Boston, Mass., Assignor of one-half to John William Linzee, Jr., same place.

429,988. Gas Pressure Gun and Method of Operating the Same. Edmund L. Zalinski, U. S. Army, Assignor to the Pneumatic Dynamite Gun Company, New York, N. Y.

429,991. Friction Surface. John V. Beekman, Brooklyn, Assignor to the Lidgerwood Manufacturing Company, New York, N. Y.

429,997. Water Indicator for Boilers. James J. Campbell, West Elizabeth, Pa.

430,000. Method of Uniting the Edges of Shell Metal. William H. Clark and William J. Clark, Salem, O

430,008. Mode of Cold-rolling Tubes. George H. Everson, Pittsburg, Pa.

430,014. Manufacture of Shovels. Patrick W. Groom, St. Louis, Mo.; Joseph Kennedy, administrator of said Patrick W. Groom, deceased.

430,015. Surveyor's Instruments. John R. Hanlon, Pennington, N. J.

430,039. Railroad Tie. Patrick Rafferty, Ovid, N. Y., Assignor of two-thirds to Peter Finnegan and James Cranney, both of same place.

430,041. Method of Manufacturing Glass-lined Pipe-fittings. Dan Rylands, James Crowder, and Robert Morant, Assignors to said Rylands.

430,049. Ore Crusher. Giles W. Wellen, Baker City, Oreg.

430 052. Railroad Joint. Reuben M. Agee and Edwa d Lane, Canton, Mo.

430,053. Friction Clutch Pulley. Johan M. Anderson, Boston, Mass., assignor of one-half to Albert Anderson, same place.

430,058. Method of Separating Ores Magnetically. Clinton M. Ball, Troy, N. Y., and Sheldon Norton, Hokenduaqua, Pa., Assignors to the Magnetic Separator Company, Watervliet, N. Y.

430,073. Gravity Hoist. William J. C. Doyle, Aspen, Colo.

430,074. Metallic Piston Rod Packing. John L. Halyburton, Philadelphia, Assignor of one-half to Charles M. Rhodes, Wayne, Pa.

430,087. Pneumatic Gun. Nat. W. Pratt, Brooklyn, N. Y.

430,097. Friction Clutch. Lewis H. Watson, Chicago, Ill.

430,101. Method of Regulating Firing Fluid Delivery to Pneumatic Guns. Edmund L. Zalinski, Fort Hamilton, N. Y.

PERSONALS.

Col. F. Beaumont, of London, has been in this city during the past week on his way from India to London.

Mr. Stephen R. Lesher, of the firm of Lesher, Whitman & Co., of New York, has been elected a director of the Phœnix Mining Company, of Arizona.

Mr. S. White, Jr., has been appointed Chairman of the Committee on Mining Securities of the New York Consolidated Stock and Petroleum Exchange.

The American Association for the Advancement of Science has appointed a committee to work for the exclusive use of the metric system in the medical world.

A cablegram to-day says: The trial of the libel suit brought by George Washington Butterfield, an American, against the *Financial News*, of London, England, for publishing articles declaring that a mining operation in America in which the plaintiff was interested was a wild and impudent scheme, ended June 12. The *Finanelal News* submitted evidence to prove that the articles were justified, and the jury found a verdict for the newspaper.

Mr. J. P. Olympius, of Denver, Colo., member of the Colorado Mining Exchange is in this city on business. He is the representative of the French Mountain Gold Mining Company. Mr. Olympius has been cordially received by members of the local Exchange, and he says he feels that certain Colorado mines should be in the list of the Consolidated Stock and Petroleum Exchange. He discusses the method of the Denver exchange and most of our brokers deem his points good, sound ones, calculated to promote the mining industry.

Extract from a letter from Mr. Anthony Pulbrook, chairman of the North Mexican Milling and Mining Company, to the *Weekly Bulletin*, of London: "Every English mining director should pay a visit to the editor of the ENGINEERING AND MINING JOURNAL of New York (the best mining paper in the world), and he will learn much to his advantage. Had our English visitors conned the columns of that paper before investing in American mines they would have been many thousands of pounds in pocket."

The *Witwatersrand Mining and Metallurgical Review* is the title of a bright little monthly magazine which comes to us from the Transvaal. It is published at Johannesburg, and is devoted to the interest of the South African gold fields. The second issue, just received, contains among its original contributions papers on the following subjects: "Geological Features of the DeKaap Gold Fields;" "Suggestions for Improvements in Mining and Milling;" "Occurrence of Gold in the Witwatersrand Conglomerate;" "Gold Milling in the Black Hills of Dakota;" "Ore Deposits in Limestone Formation;" "Extraction of Gold by Lixiviation," besides correspondence, general mining information, etc. The typography and general appearance speak well for the present state of development in the Transvaal.

OBITUARY.

Daniel E. Riker, of the drug and chemical firm of J. L. & D. S. Riker, of this city, died on the 10th inst. Mr. Riker was in his 55th year. He had been engaged in the chemical business for nearly 40 years, having been connected with the firm of which he was a member at his death, for 30 years.

The death is reported of Andrew Penny, the Silver King of Bolivia, S. A. Mr. Penny was born in Birse, Scotland, in 1832, and took to the sea for a livelihood. After voyaging in all parts of the world he determined to explore the hidden wealth of the silver mines in Bolivia and succeeded in a marvellous degree.

Richard K. Cooke, one of the oldest members of the Consolidated Stock and Petroleum Exchange, New York, died on the 11th inst., at his home, in Elizabeth, N. J. He was well known in Wall street, and had many friends. He was a member of the Open Board of Brokers, and when it was consolidated with the Stock Exchange, in 1869, he became a member of the new body. For several years he was a member of the Governing Committee of the Stock Exchange, and acted at one time as chairman of the Committee of Arrangements. In 1878 Mr. Cooke left the Stock Exchange and joined the New York Mining Stock Exchange, merged subsequently into the Consolidated Stock and Petroleum Exchange. He held the offices of director and superintendent in the latter organization for several years.

INDUSTRIAL NOTES.

The Lidgerwood Manufacturing Company, New York, hereafter will be represented in Utah, Montana and Idaho, by Messrs. Fraser & Chalmers.

The great steel works at Llandare, Glamorganshire, Wales, are said to have been purchased by a German syndicate for the purpose of manufacturing steel tubes by the Mannesmann process.

An exposition of inventions and devices to prevent accidents in factories and to promote industrial hygiene will be opened in Amsterdam, Holland, on the 16th inst. and last three or four months.

The national exposition in Prague, Bohemia, in 1891 will have an annex exhibition of international character. All foreign inventions and patented articles will get space allotted in the buildings reserved for this additional section.

The Monongahela Manufacturing Company's works at Monongahela City, Pa., consisting of a foundry, machine shop, blacksmith shop and pattern department, together with all the out-buildings, were burned on the 12th inst.

The contract for rebuilding that portion of the United States Rolling Stock Company's car works recently destroyed by fire at Decatur, Ala., has been let to George Moxon, who is under agreement to complete the buildings inside of 90 days. The car-wheel department of this plant is running steadily.

The Wampum Iron Works, at Wampum, Lawrence County, Pa., were sold by the sheriff on the 3d instant to Mrs. Anna M. Louder for $19,000. Mrs. Louder was plaintiff in the writ, she having held a mortgage against the company, which had been assigned to her by Andrew Carnegie. A furnace was built on this property in 1856. It was torn down in 1887.

A rolling mill for the manufacture of merchant bar iron from scrap is being built at Fort Worth, Tarrant County, Texas. It is to be called the Texas Rolling Mill and Iron Works, and will have a daily capacity of about 40 tons. The officers are G. E. Beach, president and general manager; J. G. Williams, vice-president; H. Schwartz, secretary; E. H. Keller, treasurer, and P. H. Durack, superintendent.

The firm of Yarrow & Co., London, England, has lately constructed for the Portuguese and English governments some shallow-draught gun-boats for service on the Zambezi and Shire. *Mosquito*, one of them, was put together from the different portable parts, launched, and put under pressure on the Thames within only six hours. The contract allows twenty-four hours for the performance of the same operation in South Africa.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received the contract for the iron buildings for the Huanchaca Company, of Bolivia, South America, which will consist of a boiler house 45 feet by 60 feet, an air compressor house 45 feet by 80 feet, and an engine house 42 feet by 75 feet. These buildings will be made entirely of iron, put together in this country, taken down and shipped to Bolivia, where they will be erected by native workmen.

The Chattanooga Pipe Works, in Chattanooga, Tenn., are in a good condition. When the Bridgeport works are completed a large part of the manufacturing of pipes will go there. The Pipe Works Company expects to break soil at Bridgeport within six weeks. The foundry will take several months to erect. Two large pits will be constructed at Bridgeport; all pipes over 24 inches diameter will be cast there. The smaller pipe will be cast at the South Chattanooga works.

An electrical exposition will be held in Frankfort on the Main, Germany, in 1891. The committee intends to make the electrical transmission of power a prominent feature by exhibiting a number of shops in actual operation. The main purpose is to convince the public of the effectiveness of electro-motors, the introduction of which on an extensive scale is deemed one of the few, if not the only means, to save industrial pursuits from being absorbed by huge, practically monopolistic concerns.

The Lookout Rolling Mill Company, Chattanooga, Tenn., is running its plant the same as heretofore. There is no change in the management or the character of the work. The present company will book future orders, which will be transferred to the New England City company when the mill is transferred to New England City. The transfer of this plant will not take place until the latter part of the summer. The owners of the Lookout ground are endeavoring to negotiate for some other plant to occupy the mill.

The United Edison Manufacturing Company has issued an illustrated pamphlet which gives a great deal of interesting matter concerning the incandescent electric light system in New York City and elsewhere. To those who are not thoroughly familiar with the interior mechanism of electrical apparatus many of the drawings will afford instruction. The information contained in the book covers the whole ground, and will be found of practical service to those who contemplate using electric lights, as well as to those who are supplied.

We have received from Messrs. Ribon & March an exceedingly fine working model of their new dumping car, which is now being extensively used in metal and coal mining and in railroading. The model is made of brass, silver plated and oxidized. The car itself turns on a pivot on the truck, and can be turned to dump at any angle. The sectional gear on which it turns is cogged, and a cam at either end holds the truck in any one of three positions; that is, to dump on either side and fixed upright. An illustration of the car will be found in our advertising columns.

The law permitting shipbuilding establishments to increase their capital to $5,000,000 has, it is stated, been taken advantage of by Messrs. Cramp & Sons, the well-known shipbuilders of Philadelphia, to increase their capital stock to $3,500,000. Among the largest of the subscribers to the new stock are named Messrs. Seligman, bankers, of New York, and Thomas Dolan, of Philadelphia, and it is authoritatively said that a powerful and important steamship organization in Philadelphia has signified its intention to take another large portion. It is understood that the large tract of land purchased a short time ago near the property of the Pennsylvania Salt Works, in Philadelphia, and comprising about 60 acres, was bought for the purpose of building a new shipyard to meet the demand on the part of shipowners for increased dimensions of mercantile and warlike vessels.

It is reported that plans for the erection of iron and steel works at Kirkland, Wash., on the eastern shore of Lake Washington, opposite Seattle, the execution of which has been suspended for some time, are now consummated. The negotiations, which have been quietly progressing for several months, are said to have reached a favorable conclusion, so that the erection of the works will begin immediately. L. J. Hunt, who is at the head of the movement, said to an Associated Press correspondent recently: "We will expend $1,000,000 within the next 12 months, which will be the beginning of our enterprise, and, as to the ending, you should be able to draw pretty safe conclusions from the character of the men interested. Among those who are actively interested in the iron company are: Gen. Russel A. Alger, of Detroit, Mich.; Joshua M. Sears, of Boston, Mass.; H. A. Noble, of Des Moines, J. L. Norton, of Chicago, Peter Kirk and W. W. Williams, formerly of England, but now of Kirkland, and Edward Blewett, Jacob Furth and Bailey Gatzert, of Seattle, Wash.

The Howard-Harrison Iron Company, capital $500,000, has filed articles of incorporation at St. Louis, Mo. The stockholders are: Thomas Howard, J. W. Harrison, Peter McArthur, F. B. Nichols, E. H. Queen, Louis Hoster and Louis Doyle. This company is an outgrowth of the Shickle, Harrison & Howard Iron Company of St. Louis. Some time ago the Shickle, Harrison and Howard Iron Company purchased 65 acres of ground near Benton, Mo., with the intention of erecting new buildings thereon for a foundry, and it also intended to remove its old plant in St. Louis to the new location. But after consideration it was determined not to erect buildings on the site near Benton.

It decided to go south and began looking around for a favorable location. Bessemer, Ala., offered them 80 acres of ground free. This was accepted and works are now being erected there that will have a capacity of 200 tons of piping per day. The old foundry in St. Louis, which has a capacity of 200 tons of piping per day, will still be kept in operation.

The base price for puddling during the next scale year in the iron mills of Pittsburg and all Western and Southern points will be $5.50, and on a two-cent card the same as this year's scale. This figure was decided upon finally on the 9th June session, at Pittsburg, Pa., of the convention of the Amalgamated Association of Iron and Steel Workers. By this decision it follows that there will be little change in the scale of prices paid to iron workers for a period of more than a year. The vote which decided this important question was, it is understood, something like 133 to 107.

On the 10th inst. the Association decided to leave the base of the bar mill the same as last year, which was 70 cents, but some slight changes will be made in extras. The price for puddling iron in the Eastern district (east of the Alleghenies) will be $4 per ton. The price heretofore has been $3.50. This means that the Eastern workers will demand an increase of pay all around approximating 15 per cent. In this question of increased pay the position of the Amalgamated Association is that the raw materials do not cost 38 per cent. more than is paid by Western men, yet the East has enjoyed the advantage of 38 per cent. in its favor of labor. The manufacturers of Pittsburg and other Western points, it was said, commend this decision. There are about 135 mills in the East.

The Jeffrey Manufacturing Company, of Columbus, Ohio, manufacturers of coal mining machinery, power drills, etc., writes us that the electric coal mining machines are doing good work and the demand is largely increasing. The report up to June 1 shows the following shipments: Shawnee Iron Point Coal and Iron Company, Shawnee, O., two electric machines; Ellsworth Morris Coal Company, Jobs, O., three electric machines; Sterling Mining Company, Cannelton, Pa., two electric machines; Maungot Coal and Coke Company, Fairmont, W. Va., four electric machines; Thurmond Coal Company, Thurmond, W. Va., four electric machines; Consumers Coal and Mining Company, Camden, W. Va., one electric machine. The following additional orders have been received: Morgan Run Coal Company, Coshocton, O., one electric mining ma-

chine; Consumers Coal Company, Camden, W. Va., (second order) one electric mining machine; Ellsworth Morris Coal Company, Jobs, O. (second order), four electric mining machines; and one haulage car; Upson Coal Company, Shawnee, Ohio, two electric machines and one electric haulage car; Maungot Coal and Coke Company, Fairmont, W. Va. (second order), one electric machine.

The Virginia Eggette Fuel Company has been chartered in Richmond, Va., as an artificial fuel company. It has an authorized capital of $100,000, with the principal office at Richmond. The intention of the company is to manufacture into egg shapes the Culm coal from the Gayton mines, 14 miles from Richmond, where the extensive coal breakers now in operation make much waste otherwise unavailable.

CONTRACTING NOTES.

The Lebanon (Pa.) Chain Works has been awarded the contract by the Secretary of the Navy to furnish all buoy chains for the United States coast, from Maine to California, for the ensuing 12 months.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

875. Equipment and 30-pound steel rails for two miles of logging road. Virginia.
876. Engine for saw mill. Alabama.
877. Complete canning outfit. Texas.
878. Steam plant for power, electric plant, ties, iron T rails and all supplies required for an electrical suburban railroad. District Columbia.
879. 60 or 75 H. P. engine and boiler to match, 10-ton cupola, shafting, hangers, pulleys, etc. Virginia.
880. One 10-foot boring and turning mill, lathes, planers, milling machines, radial drills, etc. Pennsylvania.
881. Correspondence with parties with whom we could sublet about 19,000 cubic yards of dredging, and with parties who have dredging machines to sell. Tennessee.
882. Estimates on machinery for sawing out and preparing shuttle blocks from dogwood. Machinery to be run by water power or steam. Virginia.
883. Automatic engine, return tubular boiler, live rollers, slab conveyor, dry kiln, heavy flooring machine, light locomotive and steel rails. Georgia.
884. Correspondence with the manufacturers of machinery for making butter dishes (wood) fruit baskets, berry boxes, etc. New York.
885. Ice machine with a capacity of 8 to 10 tons per day. North Carolina.
886. Machinery for steam laundry, canning factory and steam cracker bakery. South Carolina.
887. Heating furnace to heat from 1,500 to 2,000 railroad car links per day for welding, and head bars, 15 or 16 feet long, for bending. Alabama.
888. Bids for sinking an artesian well 750 feet, for building a brick tower 100 feet high, with a tank on top 20 × 25 feet, and for engine, boiler, pumps, pipes, etc., sufficient to elevate water to the tank at the rate of 50 to 100 gallons per minute. Georgia.
889. Rock crusher complete, capacity 100 yards per day. Also a mill for grinding sandstone, capacity about 100 yards per day. Tennessee.
892. Shingle machine to cut cypress shingles. North Carolina.
893. Party to establish and operate waterworks and electric plant. Georgia.
894. Machinery for canning factory. Florida.
895. Engine, 50 H. P. Boiler, 70 H. P., brick machine, clay crusher, etc. Texas.
896. Tubular boiler, 30 or 35 H. P., planer with 6 feet bed; engine lathe not less than 24-inch swing, and small machine tools. Tennessee.
897. Machinery for a steam laundry. Georgia.
898. Engine and boiler of 12 or 16 H. P., grist mill, shafting, pulleys, etc. Mississippi.
899. Portable boiler and engine, 8 or 10 H. P., mounted on wheels ready for the road. Arkansas
900. Passenger elevators, machinery for steam laundry, and steam heating apparatus for a hotel of 150 rooms. Florida.
901. 15 H. P. self-containing engine with locomotive boiler on skids. South Carolina.
902. Contracts for boring an artesian well and building water works will be awarded, if bonds to the amount of $10,000 are authorized and no opposition is anticipated. Georgia.
903. Prospecting drill and well auger to prospect for coal and other minerals. Virginia.
904. Locomotive 25-pound rails and everything necessary for the equipment of five miles narrow gauge log railroad. Mississippi.

AMERICAN GOODS WANTED ABROAD.

847. Prices of sugar machinery, coffee hullers, cleaners, polishers and street sprinklers. Venezuela.
853. Catalogues of machinery and plant suitable for dredging beaches and river beds for gold, together with the appliances (tables, etc.) for saving the gold. England.
854. Catalogues, circulars, etc., of manufacturers of machinery for mining and silver-reduction works. Mexico.
855. Pitchforks, rakes and threshing machines. Prices on large quantities delivered in France.
905. Addresses of manufacturers of barb wire and pulverizing cultivators. West Indies.
906. Machine for hulling castor oil beans. Mexico.
907. A party in Mexico would like to represent manufacturers of plows, cultivators, seed sowers, corn shellers, grain mills, fodder cutters, churns, ice cream freezers, barb fence wire, stretchers and diggers.

GENERAL MINING NEWS.

The Colorado Coal and Iron Company will build 150 coke ovens at Crested Butte, Col., during the summer, which means the doubling of the coke capacity, as they already have that many in full blast all the time.

The Fort Payne Coal and Iron Company, of Fort Payne, Ala., will, it is stated, build 1,000 coke ovens and develop its coal property on Sand Mountain.

The Woodward Iron Company, near Birmingham, Ala., has opened a new coal mine and built a number of new coke ovens.

A contract for 100 coke ovens for the Pine Mountain Iron and Coal Company, at Pineville, Ky., has been let.

The Lone Star Iron Works, of Jefferson, Texas, will build 22 coke ovens.

It is reported that the Virginia Coal and Iron Company has commenced the development of its coal properties, near Big Stone Gap., Va., and has in contemplation the erection of a number of coke ovens.

READING & CHESAPEAKE COAL AND RAILWAY COMPANY.—There was placed on record on the 9th inst., at Reading, Pa., a mortgage for $2,000,000 given by this company to the Farmers' Loan and Trust Company, of New York, as trustees. The Reading and Chesapeake is a new railroad projected to run from Reading, Pa., to Havre de Grace, Md.

ARIZONA.

GILA COUNTY.

BUFFALO COPPER COMPANY. — Through the efforts of Dr. Alex. Trippel, M. E., the owners of the Buffalo group were induced to have them exploited, with the understanding that if ore was found in sufficient quantity to justify smelting, the mines and smelting plant would be put in shape to begin the production of copper. Local papers report that six weeks' work sufficed to justify Dr. Tippel's estimate of their value and warrant the expenditure necessary to make them productive. A body of ore was encountered several weeks ago, which later development has shown to be large. It is free smelting ore and said to be rich. About 15 men are employed in the mine, and 12 or 13 overhauling the machinery at the smelter and repairing roads. A new water jacket and some machinery will be needed, and it will be two months yet before smelting will commence.

CALIFORNIA.

A syndicate of London capitalists has purchased for $350,000 mining claims covering two miles of the bed of the Feather River near Oroville, and will begin operations on a large scale.

The entire river is to be diverted about a mile and a half by means of a dam and canal, the remaining water pumped out, and the bed of the river sluiced. Connected with these mining operations are to be large irrigating works, extending over several hundred thousand acres of land.

The purchase includes the Old Cape, Union Cape and Greek mining claims, which end about a quarter of a mile above Oroville. The Old Cape claim covers the river bed for 3,000 feet. In 1857, a company of Oroville men put in a dam and a low flume, at an expense of from $200,000 to $250,000. Only 1,500 feet of the claim was worked, but in 42 days $1,000,000 worth of gold was taken out and paid as dividends. A sudden flood then swept away the entire system of works, and no extensive operations have been begun since.

The Union Cape claim, 6,000 feet long, just below the Old Cape claim, was worked in 1858 by another company of Oroville capitalists after extensive works had been erected, and $250,000 was taken out in a few days, 2,300 feet being flumed.

Then a flood destroyed these works, and active operations have never been resumed. Since that time the claims have been in a tangle of litigation and dispute, and a great number of people have filed claims on the location.

The Greek claim covers all of the old Union Cape claim, and a little of the bed below.

The claims were taken up some years ago by Judge P. O. Hundley, Joseph Henley, Judge Gale, Secretary of State W. C. Hendricks, J. W. C. Gray, and other prominent men of Butte County, and patents for their claims were obtained from the Government only a few weeks ago.

Major McLaughlin, who made the sale, stated that the new company is incorporated as the Golden Feather Channel Company, limited, of London. A thorough investigation and survey as to the feasibility, cost and probable success of the scheme was made by W. H. Hall, supervising engineer of the arid lands survey, and ex-State engineer. His report, including maps and estimates, was made last month. After his report was received, the company was formed and the purchase made. The work of excavation of a canal to carry the entire waters of the river around the claims for about two miles during the six or seven summer months of the year, will begin in July. A dam will be built across the river, and the canal will be walled a part of the way, and excavated through rock in places. It will run along the northwest side of the stream.

Mr. Hall also conceived and recommended an irrigating system which will be built. It is the intention to build a smaller canal from the lower end of the mining canal to carry as much of the water of the river as is needed on to the valley lands below by a network of canals and ditches. The system will extend from Oroville to the neighborhood of Biggs and Ridley, and will include the colony of Thermalito. There are several hundred thousand acres of fine land which can be irrigated easily. It is now in grain, and is worth about $25 an acre. If supplied with water it can be made one of the finest fruit sections of the State. It is also part of our plan to establish a water power below the end of our mining canal, where the water can be carried to a height of about 15 feet above the present river bed.

One of the reasons that these claims have not been worked more in past years is, that not long after 1858 Governor Hendricks, of Indiana, and W. C. Hendricks began hydraulic mining in Morris' ravine, and their operatiods buried the bed of the river there under about fifteen feet of tailings. This was pretty well scoured away since hydraulic mining was stopped. One advantage of these claims is that the river bed there is not full of heavy bowlders, which would cost a fortune to remove.—*Pacific Lumberman.*

MONO COUNTY.

STANDARD CONSOLIDATED GOLD MINING COMPANY.—We are officially advised that all the litigation between this and the Bulwer Consolidated Mining Company has been ended by a mutual withdrawal of all complaints, and an agreement not to renew the same.

COLORADO.

COLORADO GAS AND PETROLEUM COMPANY—This company has been formed for the purpose of seeking gas and petroleum. It will operate in Arapahoe, Jefferson and Douglas counties, in the neighborhood of Golden, where extensive prospecting has been going on for some time. The company is organized with an authorized capital of $1,000,000. It has secured by purchase and lease 6,000 acres of land and is reported to be negotiating for more. A number of Eastern capitalists, principally from New York and Pennsylvania, are stockholders. The officers and directors are as follows: President, D. C. Dodge; vice-president; Benjamin W. Bredin; secretary, Cassius C. Smith, treasurer, J. W. Gilluly; directors, Job A. Cooper, O. D. Bleakley, D. C. Dodge, E. W. Smith, J. B. Grant, J. W. Gilluly, George S. Criswell, Benjamin W. Bredin, Cassius C. Smith.

BOULDER COUNTY.

PUZZLE GOLD MINING AND MILLING COMPANY.—This company has, it is said, now on hand for development a fund of $5,257.34. The mill, a 10-stamp Gilpin county, with power for the addition of 10 stamps more, will be completed about June 15, the 10 extra stamps to be added when deemed prudent by the company.

CONEJOS COUNTY.

(From our Special Correspondent.)

ALAMOSA, June 7th, 1890.

Gen. A. K. Stiles, of Chicago, with ex-Gov. Alva Adams and Dr. P. L. Rraig, have been up to Jasper examining their claims, with a purpose of fully developing and working them. The general average of the ore was about $40 in gold and silver, and the quantity being so great, we can predict a large output for this season.

GILPIN COUNTY.

JUSTICE MINING COMPANY.—This company filed articles of incorporation with the secretary of State on the 4th inst. The object of the company is to acquire and operate mines of gold and silver bearing ores and do all things incident to the

general objects of mining. The capital stock of the company is placed at $500,000, shares $1 each. The affairs and management of the company will be under the control of five directors, and the following are selected as the directors for the first year: A. C. Hall, John W. Browning, D. I. Ezekiel, Oney Carstarphen and H. L. Morris. The business office of the company will be at Denver.

LAKE COUNTY.

IRON SILVER MINING COMPANY.—The office of this company is now located at 52 Broadway, Room 103, New York City.

OURAY COUNTY.

AMERICAN NETTIE MINING COMPANY.—Under date of June 2 Superintendent Bunce writes that after driving the southeast drift some 60 feet from the bottom of Dunham winze the ground opened and disclosed a vertical fissure about three feet wide, filled with ore that assayed 21 to 29 ounces gold per ton. The mine is now said to be in excellent shape to greatly increase the production of ore, and, unless something entirely unforseen should happen, the record for June will surpass that of any month in the history of the property. A car of first-class ore was shipped May 30 that runs 24.8 ounces gold and 41·2 silver, and a car of second-class on the same date that assayed 3.5 gold and 11·8 silver.

ILLINOIS.

PEORIA COUNTY.

Reports from Peoria, dated the 12th inst., state that the miners' strike in this district is at an end and the men went to work to-day. The operators offered sixty-seven and a half cents and the offer was accepted.

KANSAS.

CHEROKEE COUNTY.

A special report shows that during the week ending June 7th, the output of ore from the mining district of Galena and Empire City was: Rough ore, pounds milled, 2,021,990; rough ore sold, 2,021,990; zinc ore, pounds sold, 1,050,000; lead ore, pounds sold, 394,980. Sales aggregated, total value, $24,900. Total value of output, $28,760.

MICHIGAN.

COPPER MINES.

(From our Special Correspondent.)

HANCOCK, June 11.

ALLOUEZ MINING COMPANY.—The May output of the company weighed up 128 tons, 110 pounds. This is the first month's product since the mine resumed production, and is considered a very creditable showing. A new compressor is to be started June 15, after which considerable exploratory work will be carried on.

ARNOLD MINING COMPANY.—The property of this company is located in Keweenaw County, in the vicinity of the Copper Falls mine. A party of miners under the supervision of Capt. J. H. Moyle was recently started on a true fissure vein of quartz, which crosses the formation with a northwest and southeast trend. It is the intention, as soon as adequate labor can be secured, to run a tunnel from the foot of the bluff to this vein, a distance of about 3,400 feet. The point of intersection will be about 1,000 feet from the outcrop. This tunnel will, of course, serve to prove up the territory through which it passes, much of which is supposed to contain valuable mineral deposits.

CALUMET AND HECLA MINING COMPANY.—This company is rapidly completing arrangements for the receival and use of its electric motor plant. No. 11 South Hecla shaft has been selected for use as the water shaft of this portion of the mine. A vertical hole has been drilled, cutting the shaft at the 16th level. It will be used as a wire-way for the lines carrying the electric current. Several holes of a similar character were drilled opposite the mouths of Nos. 3, 4, 5, Calumet shafts, at the time of the last mine fire (about January, 1889). Owing to the loose character of the hanging in this part of the mine they are reported to have been a failure. The company is putting in a second blister furnace at its smelting plant. It has been stated upon good authority that the company has decided to put solid foundations under all its stamp heads. In the Calumet and the Hecla mills there are 18 heads in use. For over a year a solid foundation has been in use under No. 1 Calumet head, and has proved to be a success. Besides taking the place of the expensive spring timbers, and causing less jar to the mill, it has, by actual test, enabled the head to stamp from seven to eight per cent. more rock with the same amount of steam. A solid foundation has also been used in connection with No. 11 Calumet head for some time. The success of these two foundations has led the company to decide upon the adoption of similar ones for the remaining 16 heads. The foundations for the huge pump and engine, soon to be put in place at the stamp mill plant, are ready for the receival of the huge granite blocks which are to serve as the base of the machinery. As has been previously stated, this plant is to be located adjoining the present pumping station. It will be separated from the latter by a brick wall three feet thick. The output of the mine for the week ending June 9th was 798 tons 170 pounds.

COPPER FALLS MINING COMPANY.—In a recent interview with Capt. J. H. Moyle, agent of this company, the writer learned a number of facts of interest concerning its property. The stamp mill which started up a week ago is now running two of its four heads day shift, or about one-fourth of its capacity. Curtailed operations of the mill are occasioned by lack of miners. When the mine partially shut down last winter a large number of employes found situations elsewhere.

The extensive explorations which are now being carried on over different properties of the mineral range, have utilized that skilled transient labor which is always to be found in every community. As a result the company is compelled to work 100 men where 200 are needed. As soon as adequate help can be obtained the mine will be run full force. Rock is being taken from the different openings of the ash bed from the 10 to the 160 fathom level. Heretofore it has been the practice to select ground where pockets were to be found. It has lately been found that much of the neglected rock was more regular in its copper bearing properties than was expected, and that it can be worked to a profit. During the time the mine suspended production much attention was paid to opening it up; as a result it is more extensively opened to-day than it has been for years.

DETROIT AND LAKE SUPERIOR SMELTING COMPANY.—The rise in coppers has perceptibly stimulated production among the lake mines. The Detroit and Lake Superior Smelting Company, which refines the Allouez, Atlantic, Central, Copper Falls, Franklin, Huron, National, Peninsula and Quincy mining companies, as well as the tributer's copper, has been working five furnaces during the past winter. This week it started a sixth, and is getting a seventh ready for use.

QUINCY MINING COMPANY.—The May output of this company was 425 tons 930 pounds, against 401 tons 450 pounds for the month of April. The output since January 1 has been 1,802 tons 1,765 pounds.

TAMARACK JUNIOR MINING COMPANY.—This company, during the previous month, sunk No. 1 shaft a distance of 100 feet, making a total depth of 2,002 feet. No. 2 shaft was sunk 72 feet during the same time, making a total depth of 1,404 feet. It is expected that No. 1 shaft will reach the lode about Jan. 1, 1891.

IRON MINES.

APPLETON MINING COMPANY.—The stockholders of this company have deemed it advisable to incorporate under the laws of the State of Michigan. The company will be known as the Appleton Mining Company, with a capital stock of $500,000. The following were elected directors of the company: S. F. Clark, John H. Barrington, Francis Blackwell, Mathew Powley, John G. Sewell and Harry Williams, Norway, and Luther M. Packard, Menominee. At a meeting of the directors the following officers were elected: Samuel F. Clark, president; John H. Barrington, vice-president; Luther M. Packard, secretary, and Francis Blackwell, treasurer. The Appleton property is located on the Sturgeon River, about four miles from Norway, upon which considerable diamond drill work has been done during the year. Diamond drill work has ceased, and the unwatering of the 24-foot shaft has been commenced with a view to sinking it. President Clark says that a contract to sink the shaft will be let, and the work upon it will be vigorously pushed.

MINNESOTA.

ST. LOUIS COUNTY.

DULUTH & IRON RANGE RAILROAD COMPANY.—This company held a meeting at Duluth on the 9th inst. The report showed net earnings for the year of $150,000. H. H. Porter was elected chairman, H. R. Bishop, president, M. J. Carpenter, vice-president and general manager, C. W. Hilliard, secretary and H. A. Patterson, treasurer.

MINNESOTA IRON COMPANY.—The annual meeting of this company was held at Duluth, Minn., on the 9th inst. The report showed a profit of $1,000,000 for the last year. H. R. Bishop was elected president.

ZENITH MINING COMPANY.—This company, at Ely, is reported on a better footing than ever before, its recent reorganization meaning business. The officers under the present arrangement are: Edwin Ellis, Ashland, president; Geo. C. Greenwood, Duluth, vice president; J. H. James, Duluth, general manager: N. J. Willy, secretary and treasurer. This company has commenced the work of thoroughly exploring the Zenith property, and has placed Capt. Nick Cowling in charge. The company will put in machinery and push the work already begun. Among other new stockholders are said to be H. M. Bradley and H. H. Myers, of Duluth, and C. H. Bradley and H. E. Tremain, of Bay City.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, June 9.

The output from the lead and zinc mines for the week ending June 7 was very large.

The price of zinc ore declined slightly from the previous week. The ruling price paid by the ore buyers was $24 to $25.50 per ton, with some sales for choice lots at $27. Because of the decline a large amount of the week's output is held over.

The lead market continued strong during the week and sales were made at $24 per thousand. The following is the sales from the different districts as far as reported:

Joplin mines, 1,347,782 pounds zinc ore and 252,245 lead; value, $22,437.

Webb City mines, 1,035,530 pounds zinc ore and 47,800 lead; value, $13,779.

Carterville mines, 870,610 pounds zinc ore and 120,410 lead; value, $13,494.

Zincite mines, 398,870 pounds zinc ore; value, $4,884.

Lehigh mines, 156,120 pounds zinc ore; value, $2,030.

Oronago mines, 51,550 pounds zinc ore and 8,740 lead; value, $854.

Galena (Kan.) mines, 1,050,000 pounds zinc ore and 394,980 lead; value, $24,900.

All districts total value, $82,378.

DIAMOND LEAD AND ZINC COMPANY; SNYDER BROS. MINES; EMPIRE ZINC COMPANY; AND MAHUSKA LEAD AND ZINC COMPANY.—These four adjoining properties, located one and one-half miles southwest of the City of Joplin, produced for the week ending June 7th, 828,700 pounds zinc ore, and 141,040 lead, with a total value, at present market price of lead and zinc ore, of $14,137.96.

On a trip around among the mines, your correspondent descended one of the shafts on the Snyder Bros.' lands, which is sunk to a depth of 50 feet, from which about 30 feet of drifts have been done, showing a large body of lead and zinc ore. A force of ten men are employed in mining and cleaning the ore at this shaft, and they are turning out an average of five tons of clean zinc ore per day.

FRYE BROS., the pioneer mine operators, mined, hoisted and cleared up from one shaft during the past week 200,000 pounds zinc ore and 80,000 lead.

OSWEGO MINING COMPANY.—This company held over about 75,000 pounds zinc ore from their last week's output.

THE ELECTRIC LIGHT AND POWER COMPANY at Grand Falls has just received three new dynamos; two of them are 50-light machines for the arc circuits and the third is an 80-H. P. generator which will be used in the mining plant. Work on the big dam at the falls, which is to be 1,000 feet long, will soon be commenced.

Last week, Mr. T. F. Clohesey, the well-known electrical engineer, of Kansas City, Mo., closed a contract to furnish the above-named electric company with a 1,000 horse power plant. The Detroit Motor Company furnishes the plant, and 150 motors, ranging from five to 20 horse-power, were included in the sale.

The plant at Webb City will be placed in position and operation at once. Two hundred horse-power will be in operation in 30 days, an additional 300 horse-power in 60 days and the balance in 90 days. The price of the plant is $98,000.

The Jasper County Power Company has a stock of $150,000, all paid up, and expect to have 2,000 horse-power in operation inside of a year. The company has a 30 years' franchise and its officers are: Hon. W. P. Munro, Nevada, president; Judge D. P. Stratton, Nevada, counsel; O. K. Caldwell, Nevada, treasurer; Hon. T. F. Clohesey, Kansas City, secretary and electrical engineer.

The power will be distributed over a radius of one-half to three-quarters of a mile from the two cities, and will be used in hoisting, ore crushing, pumping, jigging, tramming and furnishing light for the mines.

THE SOUTH JOPLIN LEAD AND ZINC COMPANY. The new concentrating plant on this property is doing good work. Its outfit consists of a 50-h. p. economic boiler and two engines, crusher, rolls and jigs, and two 8-inch pumps.

W. S. PORTER has put in position at his mine near Carthage the largest hoisting engine used in any of the camps.

MONTANA.

The smelters in Butte have heretofore drawn all their coal supply from the Union Pacific Company's coal mines at Rock Springs, Wyoming. The railroad company delivered this coal to the smelters for $7 per ton, mine weights, and run of mine coal. The average difference between the weight of the mines, and the weight received at the smelters was 12 per cent. The Anaconda Company, however, have had entirely different treatment at the hands of the railroad company. The coal sent them is screened at the mines, is weighed and screened in Anaconda, and the actual amount taken is all that is paid for. We are also reliably informed that the price charged for the coal is only $5.75 per ton. It is true that the Anaconda Company uses about three times more coal than all the Butte smelters together, but it seems somewhat as if undue preference were shown the company. The Anaconda Company buys ores in competition with the Butte smelters, and this difference in the price of coal gives them an advantage over their competitors. The Butte smelters now draw a considerable portion of their coal supply from Sand Coulee and Cokedale coal mines, and it is probable that a still greater quantity of Montana coal will soon be used.

LADY RICKER MINING COMPANY.—This company has recently secured two full locations to add to its list of properties. The Lady Ricker (patented), the Lady Ricker Extension and the

Armilda, situated in Lewis, Clarke and Jefferson counties, are all located along the same vein and give the company almost 4,500 feet in a direct line toward the Josephine mine. In addition to this it has the Ohio lode, lying parallel to the Lady Ricker, and adjoining it, and twenty acres of placer ground below the tunnel and a water right appurtenant to the placer. This company has the only eligible tunnel site in that vicinity and the mountain has been penetrated to the distance of a little over 500 feet through the Lady Ricker claim and along the lode. Within this distance the vein has been cross-cut at two different points and has shown itself to be over 30 feet wide. It lies in a granite formation which is well in place and thus far the development in that vicinity has been all that could be expected. Quite recently work has been resumed upon this mine and the tunnel will be pushed forward as rapidly as practicable. Two hundred feet above in the bottom of the sixty-foot shaft, the pay chute is well defined and over 18 inches thick, and is said to average $100 per ton in value.

BEAVER HEAD COUNTY.

A vein of coal, it is stated, has been discovered eighteen miles south of Dillon. A forty foot vertical shaft has been sunk and drifted sixty feet in the coal. The strike is looked on as one of the most important discoveries thus far encountered in that vicinity.

DEER LODGE COUNTY.

EUREKA GOLD AND SILVER MINING COMPANY.—This company has been organized by J. M. Merrill, J. D. Thomas, J. P. Reins, James Patten, A. S. Huffman and M. E. Doe. All the above named gentlemen, with the exception of J. M. Merrill, were selected as trustees to serve for the next three months. A. S. Huffman was elected president and H. F. Titus, secretary. There are 350,000 shares assessable, par value of $5. 100,000 shares of treasury stock will be placed on the market for sale at not less than 25 cents per share. The property is sitnated between Phillipsburgh and Georgetown, and consists of three leads, the Ontario, Red Nell and Crapps lode.

GRANITE MOUNTAIN MINING COMPANY.—The officials of this company, on their return to St. Louis, gave out the information that recent developments on the thirteenth level in the mine show up ore body four feet thick. The directors declared the regular monthly dividend of 50c. a share, payable June 10. This will make $9,000,000 paid in dividends since April, 1885. It amounts to $22.50 a share paid in dividends.

OPHIR MINING COMPANY.—This company has been incorporated to develop a property near the head of Ophir gulch. J. G. Sanders, Chas. H. Perrin and A. W. Ide are the incorporators. The stock of the company is divided into 200,000 shares, half of which is held in the treasury for working capital. The property has been opened at different parts 600 feet apart, exposing a vein carrying a red oxide of iron ore which is reported to assay from $131 to $192 in gold and silver, the chief value being gold.

LEWIS AND CLARKE COUNTY.

JOSEPHINE.—A little over a year ago the development of this mine was begun in a systematic manner. A small mill and concentrator was erected last summer and regular shipments of ore were made. Reports spread abroad in regard to its value and late last fall Green & Smith, of Helena, secured a bond and lease on the property and sunk the shaft to a depth of 150 feet, run crosscuts and levels and put it in good shape. In the meantime shipments of ore were made. A short time ago negotiations were entered into with Los Angeles and Kansas City parties for its purchase, and on the 4th inst., the property was transferred, it is reported for the sum of $500,000. The Josephine is situated directly on top of the main divide of the Rocky Mountains, about midway between Wickes and Champion, at the head north of the branch of the Basin Creek. The distance to Rimini by wagon road is about seven miles. It is stated that the new company will immediately put up new works and sink on the Josephine to a depth of 500 feet.

MAC.—A company was organized yesterday to work this mine adjoining the Whitlatch Union, four miles south of Helena. The incorporators and trustees are: J. C. McCann, B. F. Forbes, S. K. Davis, J. J. Fallon, W. B. Smith, Charles A. Blackburn, Thomas Jenkin, Thomas Faull. From the board of trustees officers were elected as follows, Samuel K. Davis, president; John C. McCann, vice-president; J. J. Fallon, secretary and treasurer. The capitalization is 300,000 shares of a par value of $5. Ten thousand shares of treasury stock will be placed on the market at 25 cents.

MADISON COUNTY.

Montana papers report considerable excitement over the alleged discovery of tin on the Madison, 25 miles southwest of Bozeman. The Bozeman *Courier* gives the following particulars regarding the find: "The ore, which is imbedded in ordinary quartz, is a dark brown, and somewhat resembles ordinary iron mixed with mica, found in well-defined ledges, which in places crop out to the surface. It is claimed that several assays have been made from the outcroppings which give very encouraging results, one sample yielding 2½ and another 5 per cent. tin. Mr. LaBrie, who has had experience in the Black Hills, has visited the ground and examined samples of the ore, and says it closely resembles that of the South Dakota tin mines."

Several specimens of the ore have also been examined by J. H. Hyatt, who resided for five years in the vicinity of the Black Hills tin mines, and he pronounces it tin ore, all right, and says the only question in regard to its being profitably worked depends on the amount of iron it carries in combination with the tin. The ledges can be easily traced from bluff to bluff across the Madison River, and the country for several miles on each side of the discovery has been plastered over with locations."

MEAGHER COUNTY.

CORNUCOPIA MINING COMPANY.—The owners of the Cornucopia, Mabee and Albatross mines, on Snow creek, Neihart district, have organized this mining company, to which these properties have been transferred. The trustees and incorporators are Paris Gibson, C. D. Ladd, Richard Brenan, T. E. Collins, Will Hanks, P. H. Donovan and F. P. Atkinson. The officers of the company are T. E. Collins, president; C. D. Ladd, vice-president: Herbert Matheson, secretary, and F. P. Atkinson, treasurer. The capital stock is 1,000,000 shares of $2 each, and of this amount 225,000 shares will be set aside as a working capital.

MONARCH.—The lease of the Monarch Mining Company to J. P. Reynolds. of Boston, was canceled and the mine was started up on June 3d. Dr. McCowan, of Niehart, who owned 100,000 shares, has sold 50,000 to Messrs. Clark, Eaton and Street, and 50,000 to Messrs. Hanks, Atkinson, Clingan and McDonald. The former gentlemen now own nine-tenths of the stock and the latter one-tenth. The company will begin at once hauling ore to Monarch and shipping it to Great Falls. This will continue until the smelting works are erected at Monarch. The 20 tons shipped there last winter, it is said, netted the company $125 per ton. It has a shaft 500 feet long and a tunnel of 800 feet.

NORTH PACIFIC MINING COMPANY.—This company has been incorporated, with a capital stock of $250,000, shares $1, each to work the North Pacific mine in Greenhorn district. The claim is situated on the main range, near Mullan tunnel. The quartz carries silver and lead and, from quite near the surface, returns an average assay value of from $60 to $70 per ton. The officers are: W. J. Hunter, President; Thomas Dennon, Vice-President and Manager; S. H. West, Secretary and Treasurer.

SILVER BOW COUNTY.

[From our Special Correspondent.]

BUTTE, June 4.

R. C. Chambers, on behalf of the Chambers syndicate, virtually the Anaconda Company, has commenced suit against P. A. Largey, Henry Williams, J. F. Duffy and W. A. Clark, laying damages at $500,000. The plaintiff claims that defendants have taken ore from his Bell mine, which lies south of the Speculator which the defendants are working. The veins dip from the north towards the south all along this section, and as the Speculator is north of the Bell and no ore has been taken out south of the side line, it appears, at first sight, somewhat difficult to see on what the plaintiff bases his claim.

The leasers working on the Washoe mine, belonging to J. A. Leggett, James Murray and others, in working north on the 200 level, have broken into old workings of the Parrot Company. The latter company claim that in following down the lead that apexed on their ground they came inside the Washoe's north side line.

ANACONDA COMPANY.—The work of pumping out the Anaconda mine is going on rapidly, and I was informed on Monday, when the shift changed that evening, that the water in the Anaconda shaft was 25 feet above the 800, and that they did not anticipate much further trouble on account of the copper in the water. It was found that the steel tanks were rapidly attacked by the copper in the water, and resort has been had to lining them with wood, and coating the outside thickly with tar. The guides in the shaft have been attacked, and they have constantly to be repaired. The water hoisted in the tanks is often muddy, and looks as if the ground around was caving into it. Probably the splash of the descending tank creates small ripples that tend to bring down any loose ground. It is possible that the company may find it best to have one or two specially constructed pumps made that will resist the action of the water, and use copper column pipes. The company seems very well satisfied with its refining tanks it erected at the smelter in Anaconda. They were erected more as an experiment than anything else. The cost of putting in sufficient tanks to treat 12 tons of matte daily has been over $100,000. Taking the monthly output of the smelter as 6,000 tons of matte, and computing the cost of erecting a refining plant on the same basis as the cost of the experimental plant, it would cost $1,700,000 to erect a plant capable of handling the entire output. The company finds that a considerable saving is effected that was entirely unexpected. The amount of gold contained in the matte was so small that no value was attached to it; now they find they save from $8 to $10 per ton of matte in gold—a saving that, if they refined their entire output, would amount to $50,000 to $60,000 a month

BANNISTER MINING COMPANY.—The trustees of this company recently elected the following officers: E. D. Bannister, president; J. Y. Wiggin, vice-president; W. C. Child, treasurer. and J. W. Anderson, secretary. The company has purchased the Tecumseh mining claim, located at Butte. This property was worked in the early days of Butte and produced a high grade ore. Work was resumed in February last, and it is said the development shows the Tecumseh to be a good property. This company's stock, which is held by Helena and Boston parties, is not on the market.

BLUE BIRD MINING COMPANY.—This company is endeavoring to have the bond given by James Murray in the injunction suit raised from $25,000 to $250,000. When Murray commenced suit against the company, it was expected that the matter would be brought to a final issue within four months; but the mine and mill have already been closed down eight months, and it looks as if they might be shut down for several months longer. The Blue Bird Company, whether rightly or not, is very confident that the final result of the suit will be in its favor, and so is desirous of making Murray put up sufficient bonds.

BUTTE & BOSTON MINING COMPANY.—This company has contracted with Fraser & Chalmers to erect a 400-ton concentrating plant. The concentrator will be located near the smelter. The power will be derived from a 200-H. P. Corliss engine. The ore will be crushed by crushers and rollers, the lack of sufficient water preventing the erection of a steam stamp. The ore after crushing will be seized both by trommels and hydraulic separators. After passing the jigs, the fine slimes will be treated on 20 frue vanners. All the water will have to be pumped and it is proposed to put in a Root rotary pump. The height the water has to be raised is 75 feet. Before deciding on the pump best suited for this work, Superintendent Palmer inspected the Root pump at the concentrator of the Butte reduction works. This pump raises 1,200 gallons of water per minute a height of 45 feet and has been running constantly without a single breakdown for nearly a year.

NEVADA.

SILVER HILL MINING COMPANY.—At the annua meeting of this company held recently the following directors were elected for the ensuing year: A. K. P. Harmon, president; Charles Hirshfeld, vice-president; W. E. Dean, C. E. Elliott and W. W. Erskine, directors. D. C. Bates was re-elected secretary, and A. C. Hamilton, superintendent. The company has a cash balance on hand of $17,801.15.

STOREY COUNTY, COMSTOCK LODE.

Superintendent Sharon of the Executive Committee of the Comstock Pumping Association, according to the Virginia *Chronicle*, stated recently that he is of the opinion that the draining of the Gold Hill mines down to the 2,000 level will be accomplished in 60 days after the pumps are started. The work of draining the Crown Point and Belcher down to the 1,700 level, where large ore reserves are located, will not require above two weeks. Mr. Sharon expects to have the pumps in full operation by July 1.

CROWN POINT MINING COMPANY.—At the annual meeting of this company, held in San Francisco recently, the following directors were elected: A. K. P. Harmon, J. H. Dobinson, J. P. Martin, William Norris and C. L. McCoy. C. L. McCoy was appointed President; A. K. P. Harmon, Vice-President; James Newlands, Secretary; Samuel L. Jones, Superintendent, and Bank of California, Treasurer. The company has an overdraft of $9,311.68, but it is officially stated that there is no immediate danger of an assessment. Superintendent Jones, in his annual report, states that the draining of the flooded levels of the mine will begin at an early date.

SEGREGATED BELCHER & MIDES MINING COMPANY.—At the annual meeting of this company held in San Francisco recently, the following officers were elected for the ensuing year: Thomas Anderson, president; H. M. Levy, vice-president; Morris Hoeflich, W. H. Hart, Herman Zadig, directors; E. B. Holmes, secretary, and S. L. Jones, superintendent. Superintendent Jones' report submitted at the meeting closes as follows: "While the explorations of the year have uncovered no ore bodies of practical value, the encouraging prospects encountered on the 1,000, 1,100 and 1,300 levels, and the large area of virgin ground which still remains in the mine above those levels, lead me to hope that the just reward of persistent prospecting will yet be obtained by the stockholders.

NEW MEXICO.

SANTE FE COUNTY.

SANTA FE COPPER COMPANY.—Official advices state that the company is at present doing some exploration work which thus far goes to prove that Mr. Hyams' verdict as to the worthlessness of the property was somewhat exaggerated to say the least. Very promising bodies of ore have been found which, however, require further development before any positive statements can be made in regard to their value. The management is using its utmost exertions to rehabilitate this property and is sanguine of ultimate success. Mr. J. T. McLaughlin is the company's representative

at San Pedro and is a mining captain and also acts as agent. A letter from him dated May 31, states: "I struck some very fine carbonate ore in the upraise in South drift last night. It is a vertical vein the same as the fault. I have gone up three feet and it looks fine. Will let you know if it continues. It is the only carbonate we have struck so low down in the mine. I have struck some fine ore in the winze at the bottom of incline; cannot yet tell how far the other parts of the mine look the same."

SANTA CLARA MINING AND MILLING COMPANY.—The Torres Company has been reorganized under this name. The present company is composed of Messrs. H. M. Russell, Thos. Rhodes and H. Edwin Moore. Their five-stamp mill will be started shortly. The Encantada mine, on which the company has a bond from W. B. Brecken, will furnish the ore. A shaft of 57 feet has been sunk, and it will be extended to 70 feet. A level is now being run to cut the ore body. The ore is reported to run in some places as high as $100, and averages $15 to $20. When the mine is developed the mill will probably be moved across the gulch and a wire rope-way run from the mine on the hill above right to the dump at the mill.

PENNSYLVANIA.

COAL.

A bill in equity was filed on the 10th inst., in Common Pleas Court No. 2, of Philadelphia, by Simmons H. Barrett against the city of Philadelphia and the Board of Directors of the City Trust. Barrett claims that on February 10, 1886, he leased from the defendants coal land in Schuylkill County, the lease to run from January 1, 1886, to January 1, 1899. The rental was to be $1,200 a year, payable monthly, together with royalties on the coal mined. Barrett was to have a deduction for royalty to the amount of rent. In 1887 the Schuylkill Valley Railroad Company built a branch over this leased land, depriving Barrett of the right of mining coal on the ground necessary for the construction of the company's roadbed. The city has sued him for full rent, but he believes that he is entitled to a reduction.

The strike of the Toby Valley region is ended and the miners all along the valley have resumed work at the old rate. On the Reynoldsville side of the divide some hard feeling is engendered by barring some of the ringleaders of the strike from returning to work. The failure of the strike to become general was owing chiefly to the refusal of the Dubois men to join the movement.

ELK HILL COAL AND IRON COMPANY.—We are informed officially that the colliery this company had been operating was sold last year, and it has been at work diligently for a year and a half sinking a shaft 12 × 24 over 100 feet in sand and water, in the First Ward of Scranton, on lands near Capouse Tool Works. The shaft is now thoroughly cribbed up with an inside lining with oak timber quite complete, and ready to commence sinking in rock. The company has 50 feet of coal here in some six veins. In sinking it had to contend with quicksand, and pump two or three hundred gallons of water per minute; most of this will be stoped off now. A coal breaker is being built on the grounds at Dickson City, where one was burned some six years ago, built in 1860. The present breaker will have a capacity of 12 to 1,500 tons a day.

MOOSIC MOUNTAIN COAL COMPANY.—The miners employed at the Marshwood mine of this company at Scranton have gone on a strike. The immediate cause of the trouble is an obnoxious docking boss, who was recently promoted to that position. The miners say that the cars loaded by them are generally known as canal boats. The pay for the work was $1 a car, but the new docking boss was not content with cars filled to what is known as water measure. He demanded a topping, or heap of six inches, on each car. When this was not put on he docked the miner 25 cents. The miners held a meeting, at which they decided to ask for a restoration of the 20 cents a car that had been taken off their wages some time ago, and also 25 cents advance on every yard of rock through which they cut. They asked also for lower prices on goods bought at the company's store.

SOUTH CAROLINA.

CHESTERFIELD COUNTY.

(From our Special Correspondent, Stuart W. Cramer.)

CHARLOTTE, June 9.

BREWER.—The 49-stamp mill built by Fraser & Chalmers has now been in operation about five weeks, and gives very satisfactory results. It is a thoroughly first-class mill in every respect, from the 24 x 48-in. improved Corliss engine, to the smallest detail in construction.

The ore is quarried in an open cut, loaded into cars through ore chutes to the adit below, and hauled to the mill in trains of five cars each by a locomotive.

The ore is low grade and contains a small percentage of sulphurettes, enough to pay for concentration, however, and it is probable that arrangements will be made for doing it.

The clean-up at the end of May was a creditable one for the first month's run, but Captain Motz prefers to wait until everything is in good running order before giving results for publication. I hope soon to publish the running data, as ore mined and milled, bullion yield, etc., which will be of great value to the mining men of the South in showing the cost of milling and mining with such a plant. I will also describe in detail and probably illustrate the mill.

LANCASTER COUNTY.

HAILE GOLD MINE.—At the present time this mine is very well known to mining men, as there has been a good deal of writing about the Thies chlorination process, which is being practiced here by Thies himself. Upon a recent visit to the mine I obtained permission to publish the monthly statement for the benefit of the JOURNAL's readers.

This property is undoubtedly the equal of any in the country as far as the management goes, and the results obtained will go far toward showing what can be done in the South.

The plant consists of a complete 40-stamp mill, with twenty more stamps under construction; sixteen Embrey concentrators, eight more to be added for the extra twenty stamps; two double hearth, reverberatory furnaces for roasting, one single hearth, reverberatory roasting furnace 30 feet long, with pan attachment, under construction; a Spence furnace idle, and two chlorinators.

The mining plant consists of an air compressor capable of supplying ten drills, steam hoisters, automatic dumping cars, ore chute from crushers to bin and from bin to cars, a train of six cars and locomotive for transporting ores from mine to mill, a distance of three-quarters of a mile, and automatic arrangements for dumping cars into bins in mill-house.

Knowing thus the plant, the comparison of figures will be intelligible.

STATEMENT FOR MAY.

Ore mined			2,000 tons.
" milled			2,000 "
Concentrates resulting therefrom			170 "
Concentrates treated			133 "
Concentrates added to reserve			37 "
Total expenses of:			
Mining	$1,900	or $.95	per ton.
Milling	975	" .49	"
Chlorination	600	" 4.51	"
Transportation	75	" .04	"
Total	$3,550		
Production:			
Concentrates, 37 tons, added to reserve	$1.000 (net).		
Bullion yield, 433.20 ounces	8,230.98		
Total	$9,230.98		
Bullion as follows:			
Mill bar, 190·65 ounces	$3,372.56		
Chlorination bar, 242·55 ounces	4,858.42		
Production as above	$9,230 98		
Expenditures as above	3,550.00		
Profit for May	$5,680.98		
Value of concentrates (reserve) stored in bins, 510 tons	$16,800.00		

The expenses given above include all the running expenses, supplies, wages, salaries of officers, wear and tear, etc.

UTAH.

BOX ELDER COUNTY.

CARBONATE HILL CONSOLIDATED MINING COMPANY.—This company, with a capital of $1,000,000, has been incorporated, with the following officers: Jacob B. Blair, president; Joseph Karren, vice-president; D. J. Hollister, secretary and treasurer. The company will control by lease or purchase the Matilda, Saturn, Cybele, Copper King, Rio Grande, Atlantic, Hecla, Pacific, Shoudy, Zenobia, Vesuvius, South Point and Silver Wedge lodes and mining claims, all situated on the Copper King Mountain, in the Tacoma or Pilot Peak range of mountains. Miners from that part of the territory report that the present activity in the mining industry in that region is great, and they look for a busy season.

SUMMIT COUNTY.

PARK CITY MINING COMPANY.—This company has put some men to work to clean out the Ossian tunnel and otherwise to get the property in condition for the resumption of operations this season. Some proposals have been made by parties desiring to lease the property and develop it, but the company has not yet decided how it will act.

PARK MINING AND MILLING COMPANY.—This company's property, situated up near the head of Thayne's cañon, and which has been commonly known as the Jupiter property, is reported to have a brighter future before it. The organization of a new company, in which several eastern capitalists are interested, is being perfected.

VERMONT.

BENNINGTON COUNTY.

TACONIC MARBLE COMPANY.—This company, which owns and controls some 400 acres of property at Manchester, and which has a capital of $1,000,000, is now offering 1,250 shares of its Treasury stock, par value $100, at $60 per share in lots of ten shares and upward. These shares are full paid and non-assessable, and the company has no mortgage or bonded indebtedness. Mr. Abraham Schwartz is its President and Treasurer. The company claims that it produces the finest variegated and blue marble in the world. Professor J. S. Newberry, of the School of Mines of Columbia College, has made two examinations of the company's marble lands. The proceeds derived from the sale of the Treasury stock will be devoted to the further development of the deposits and enlargement of the quarry plant. The quarries are now in practical working operation, and are favorably located for the leading markets, being only a little over 200 miles from New York city.

WASHINGTON.

OKANAGAN COUNTY.

ARLINGTON MINING COMPANY.—A correspondent whose letter was published under this heading in the ENGINEERING AND MINING JOURNAL, May 31st, appears to have been somewhat misinformed. The manager, Mr. Webb, we understand, did not, on taking charge, consider the mine capable of supplying a mill and prudently advised the making of considerable developments. The mines in the vicinity of the Arlington are mere prospects and could not supply a mill. The construction of the Arlington mill has therefore been indefinitely postponed, though a portion of the machinery is on the ground.

According to reports a ten-foot seam of coal has been discovered near Kettle Falls, on the Columbia. At Centralia it is claimed that 10 to 15 feet of coal is exposed in ravines near-by. Another coal discovery has been made on the farm of D. W. Diltz, two miles south of Snohomish, near the discovery previously reported. R. N. Canaday's coal mine on First Creek, not far from the Shauk, and about 17 miles from Ellensburg, has a seam 14 feet thick, and the coal is said to be of good quality.

WEST VIRGINIA.

MONONGALIA COUNTY.

The Supreme Court of Appeals of this State decided in favor of the plaintiffs, on the 11th inst., in an oil case involving $200,000. The tract involved is but 30 acres, situated in Monongalia County, and the parties to the suit are James M. Guffey and Michael Murphy, plaintiffs, and E. M. Hukill, defendant. In the lease held by the defendants, thought older than that of the plaintiffs, a name was wanting, which destroyed its validity, and the defendants were thrown out of court on a legal technicality.

WISCONSIN.

BAYFIELD COUNTY.

Rich deposits of copper ore, mixed with silver in paying quantities, are reported to have been found west of Drummond, near Eau Claire lakes, one vein being traced a distance of three miles. Allouez is the name bestowed upon the new range, which is properly an extension of the Gogebic iron range.

WYOMING.

President Wendell Goodwin, General Manager McLean, Donald McKinzie and other Pacific Coast Line officials are in Cheyenne, holding a meeting of their improvement company, organized to build the road across this State. They reaffirm the dispatches announcing the negotiation of a loan and the execution of contracts for construction work and equipment. The Pacific Short Line has been quietly working in this State for four years. It is reported to have secured much coal, oil and building stone land, and has a shorter and better route across the Territory than the Union Pacific. It is stated that one of their best holdings is right of way through the only pass in the Wind River Mountains possible for a railway to cross.

FOREIGN MINING NEWS.

AUSTRALIA.

QUEENSLAND.

THE QUEENSLAND GOLD MOUNTAIN.—The London *Pall Mall Gazette* says it has "reason to believe that no less a sum than £7,500,000 has been offered by an English syndicate for the Mount Morgan Gold Mine, of Queensland, and refused. Negotiations have been carried on for the sale of large blocks of stocks, and also for the whole property, but so far no arrangement has been arrived at. The authorized capital is £1,000,000 in £1 shares, 17s. 6d. being paid up. As the present market quotation is about £7 per share, it will be seen that the sum offered, although large, is not much above current estimates. The offer was made after an exhaustive examination by three experts sent out especially for that purpose. The shares have been as low as £6, and also been as high as £17, and the present holders no doubt believe they have a good property at the current price. Over a million was paid in dividends in 1889, a steady 2s. per share being divided monthly, with the exception of December, when the payment was 1s. The dividend was also 1s. for January and February, 1s. 4d. for March and 1s. 3d. for April. Even at 1s. the sum divided is £50,000 per month, or at the rate of 60 per cent. per annum.

CANADA.

PROVINCE OF NOVA SCOTIA.

(From our Special Correspondent.)

COAL.

The Springhill collieries, Cumberland County, have their three collieries running steadily, although at this season the output is usually a little reduced. Preparations are being made to extend all the workings at the depth of 1,900 feet. Bore holes are being put down to facilitate rope haulage for sinking the new lifts in the slopes.

The Emery slope of the Sydney & Louisburg

Company at Cape Breton is now pumped out and repaired, and shipments of coal will be commenced at once.

It is reported that arrangements are being made to reopen the Gardener mine, on the line of the International Coal and Railway Company. The coal is about 5 feet thick, and has always had a good reputation as a steam coal.

Shipments are well under way from all the collieries, and some of these are said to have made contracts up to their full capacity.

IRON ORE.

Important discoveries of iron ore are reported from Pugwash. The ore, brown and red hematites, is said to be free from phosphorus, and to run between 40 and 50 per cent. of iron. Further developments will, it is hoped, show that the ore bodies are large and easily worked. The New Glasgow Iron and Railway Company has completed arrangements for starting to build a furnace at New Glasgow.

GOLD.

Arrangements are said to be on foot to consolidate the principal mines in Lunenburg and Queens counties under one management. The output of the Rose mine at Montaga for last month is reported at 617 ounces.

(From our Special Correspondent.)

PORT ARTHUR, June 9.

BARYTA.—The Baryta deposits on McKellar's Island are now being worked, and the first shipment of 1,000 tons will be made some time this month. Baryta experts pronounce this to be the finest deposit in America.

IRON.—A discovery of a large deposit of magnetite of fine quality has been made on the Antler River, about 100 miles northwest of Port Arthur. In the widest part there are three beds, each about 50 feet wide, separated by narrow bands of rock running with the general course of the belt to which they belong. The deposit shows workable quantities of iron for a distance of three miles, and is traceable for about five miles. Another rich deposit has been found on the Seine River, near its mouth. Surveying parties are now taking up a large track of iron land on the Attic Okan River. Samples of the iron have been on exhibition here for some time. It assays 67·90 pure iron and contains no deleterious substances.

THE BADGER MINING COMPANY.—A new parallel vein has been struck on this Badger property, about 200 feet west of No. 1 shaft. It is three feet wide and carries silver, galena and zinc blende. The new work on the south end of the property has so far proven very successful. Several large stringers have been struck, and drifting is now being done on them.

THE BEAVER MINING AND MILLING COMPANY.—Ten stopes are now being worked at this mine, and everything is in readiness to begin milling the ore. The mill has been greatly improved. The June shipment will be ready about the 15th inst., and will amount to $15,000.

THE SHUMAH WEACHU MINING COMPANY.—A new vein has been struck 30 feet north of No. 4 shaft at the 160 foot level. The same vein has been struck cross cutting from the 200 foot level at No. 3 shaft; it is from 2 to 3 feet wide, and carries silver from $100 to $175 per ton. This mine is looking better than ever before in its history; regular monthly shipments of ore are made to Liverpool, England; it is now under the charge of Captain Thompson, late of Washington Territory, a gentleman of great experience and ability. Mr. A. L. McEwen, M. E., has charge of the office and laboratory.

THE SILVER ISLET CONSOLIDATED MINING AND LAND COMPANY—The lands lately owned by this company, consisting of 108,000 acres, have been purchased by Detroit and New York parties and are now held by John J. Marvin and Henry S. Sibley, as trustees for the purchasers. On the Edwards Island location, nine miles east of Silver Islet, a force of men, under the direction of Capt. J. H. Tretheway, late superintendent of the Shumah Weachu Mining Company, is working on a vein carrying arsenical ore, assaying 700 ounces of silver. All the lands will be thoroughly explored and reported on to the owners, when the future operations will be finally decided upon.

GERMANY.

A thick bed of quartz, the exploitation of which promises to be of the greatest importance for the glass and earthenware industry, has just been opened up between Neuhausen and Rauschenbach, in the Erzgebirge.

RUSSIA.

Russian papers announce that a large find of mercury has been made at Daghestan; analyses show the metallic contents to be 74·7 per cent. As the quicksilver mines at Ickaterinoslaf, worked by a French company, cannot supply the Russian gold mining industry's demand for quicksilver, the importance of the discovery is manifest.

It is learned by cable that reports have been received in St. Petersburg of disastrous conflagrations and great loss of life and property in the mining districts of the Ural Mountains. The iron works at Ufallisk and Newjansk, a thousand dwelling houses, four school houses, three churches, ten hospitals and the magazines were completely destroyed. Forty persons were burned to death, and eighteen thousand were made homeless by the destruction of the towns.

TURKEY.

An application is made to the Mine and Forest Department of the Turkish government for the working of all the chrome mines in the empire. Mr. Paterson, of Smyrna, is at the head of the organization. The proposal is based on a tax to the government of 15 per cent. of the net value of the ore extracted.

FINANCIAL STATEMENTS.

The following statement shows the financial balance of the principal mining companies, having offices in San Francisco, on June 1st and on May 1st, 1890:

CASH ON HAND.

	June 1.	May 1.		June 1.	May 1.
Alpha..	$19,304	*	Hale & Norcross	$12,852	*
Alta.....	20,781	$26,389	Ind'p'dence	2,248	$1,738
Andes.....	21,925	4,431	Julia	6,830	7,202
Belcher	44,458	.....	Kentuck...	146	*
Belle Isle...	1,158	2,613	Lady W....	15,938	16,764
Best & B...	*	1,333	Locom'tive	587	835
Bulwer.....	7,185	9,450	Mexican...	*	4,232
Bullion.....	17,531	19,446	Mono	10,380	10,380
Bodie C....	13,506	13,506	Ophir.....	32,326	*
Caledonia..	6,781	6,781	Overman...	32,034	23,940
Chollar.....	25,604	.....	Peer.....	2,137	3,055
Confidence.	20,047	.....	Peerless ...	*	*
†Con. Cal.& Va.....	38,061	134,758	Potosi.....	22,418	28,576
Con. N. Y..	706	3,594	Savage.....	1,352	2,224
Crocker ...	686	2,396	Scorpion...	5,043	5,573
Diana.....	2,930	3,139	Sierra Nev.	2,216	13,813
East Sierra Nevada..	4,387	5,000	Silver King	*	2,822
Exchequer.	8,770	12,496	Standard...	7,718	*
F'd Tresure	172	214	Syndicate..	4,524	4,650
Gould & Curry....	2,263	*	Utah C.....	12,441	17,363
			Un. Con....	10,035	.....
			Weldon.....	775	1,471

* Indebtedness.

† Cash in bank and $98,107 of unsold bullion on hand with further shipments to arrive before the close of the fiscal month.

MEETINGS.

Lone Jack Mining Company at room 34, No. 1 Sutter street, San Francisco, Cal., June 16, at 4 P. M.

Quicksilver Mining Company, at New York, June 18th, at 1 P. M.

DIVIDENDS.

Alice Gold and Silver Mining Company, dividend No. 24 of .06¼ per share, $25,000, payable July 1st, at the Farmers' Loan and Trust Company, New York. Transfer books close June 21st and reopen July 22d.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Aztec, Mich.....	....	May 10	June 10	June 25	10
Belcher, Nev.....	39	Apr. 29	June 3	June 24	.50
Best & Belcher.....	46	May 13	June 17	July 8	.25
Bodie, Cal	16	May 21	June 25	July 16	.25
Challenge Con., Nev	6	May 14	June 17	July 8	.50
Confidence.....	16	May 10	June 13	July 2	.75
Con. New York. ..	3	May 22	June 26	July 17	.15
Found Treasure....	6	May 22	June 26	July 18	.25
Gould & Curry, Nev	64	Apr. 28	June 3	June 26	.30
Guasucaran & Cal., C. A.....	1	Apr. 2	June 3	June 24	10 00
Hartshorn, S. Dak..	5	May 24	June 30	July 19	.00½
Holmes, Nev.....	12	May 19	June 24	July 15	.25
Mexican, Nev.....	....	May 13	June 18	July 9	.25
Morning Star, Ariz.	1	Apr. 30	June 5	June 25	.02
Occidental Con. Nev	6	Apr. 28	June 6	June 30	.25
Oro Cache, Dak.....	2	May 2	June 5	June 21	.00½
Seg. B. & Mides.., Nev.	6	May 5	June 9	June 30	1.75
Sierra Iron, Cal.....	7	Apr. 17	May 29	June 23	.20
Sierra Nevada	97	May 10	June 12	July 2	.50
Stanard Con., Cal .	3	June 2	July 15	Aug. 9	.50
Teresa, Mex	1	May 9	June 13	June 30	.10

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 697 and 698

NEW YORK, Friday evening, June 13.

From the annual report of the Consolidated Stock and Petroleum Exchange of this city, for the fiscal year ending May 31, it is learned that the dealings in mining stocks fell off considerably from the volume of business in the two preceding years.

In 1889-'90 the sales were 4,242,195 shares; in 1888-'89 they were 5,522,120 shares, while in 1887-'88 they were 7,670,378 shares. But the transactions in stocks at the exchanges is by no means an index of the prosperity or otherwise of the mining industry. While speculation has declined, actual mining, and profitable mining too, has steadily progressed. In fact, we think, with most of the real mining community, that speculation in shares is a detriment to the industry. Of course it is useful and necessary to have some convenient means of transferring interests, and this the Consolidated Exchange should supply; but we will not grieve if the number of shares which change hands there happens to fall off a little, especially as their purchase is likely to discourage investors since the majority of these shares do not and never will bring dividends.

The following mining stocks have been added to the permanent list: Ward Consolidated and Wall Street Mining and Milling; and these to the temporary list: Occidental, Phœnix, of Arizona, Comstock Tunnel (bonds and stock) and Brunswick Consolidated; also, all stocks listed on the San Francisco and Boston exchanges not heretofore placed on the temporary list.

The committee on mining securities reports that it at "various times during the year has instituted inquiries as to the condition, financial and otherwise, of nearly all the companies whose stocks are upon the permanent list. The result of their investigations made it clear that the companies hereinafter named *no longer possessed title to any property whatever.*" The scrutiny of the officers of the Exchange has been none too close in times past, and we are glad to note that it now appears to have some result. At least the following stocks, on recommendation of the committee named, have been stricken from the list: Central Arizona, Green Mountain, Little Pittsburg, Security, Taylor-Plumas, Silver Cliff, and State Lines Nos. 1, 2, 3 and 4. The ENGINEERING AND MINING JOURNAL has frequently had occasion to call the attention of the Exchange to the worthless character of some of the "securities" on this list. It seems that the warning has had a good effect. For its own sake, the Exchange cannot be too careful in listing and retaining doubtful stocks and we hope it will considerably extend the list.

The annual election for officers and directors of the Consolidated Stock and Petroleum Exchange was held on Monday, and for the first time in the history of the Exchange no ticket was presented in opposition to the regular ticket. The election resulted as follows:

President, Charles G. Wilson; first vice-president, Thomas L. Watson; second vice-president, R. A. Chesebrough; treasurer, John Stanton; chairman, A. W. Peters; trustees of grratuity fund (five years), W. S. Perry and D. K. Young; arbitration committee, W. J. Alpers, J. F. Fowler, T. Marshall, M. Heim, J. C. Elliott, G. G. Renville and H. W. Walter. Board of directors to hold office for two years: D. S. Anness, T. F. Forrest, L. T. Griffiths, L. V. De Forrest, H. A. Haven, M. Lauterbach, A. W. Peters, G. L. Ring, W. F. Moller, S. W. Curtis, W. A. Tompkins, J. E. Burnell, H. L. Kingsbury, Le Grand S. Cholwell, A. F. Baldwin, J. Gutmann, Thomas Frazier, W. F. Daniels and D. B. Mumford.

The board of directors re-elected as secretary Rudolf Huber, and as assistant secretary William H. Lewis. Both incumbents have been long in the service of the Exchange and have worked efficiently to advance its interests. The more important standing committees of the Exchange were selected as follows: Committee on Finance—Thomas L. Watson, R. A. Chesebrough, S. G. Nelson, the President and Treasurer, ex-officio; on arrangements—S. F. Strong, W. F. Moller, W. F. Davis, W. F. Daniels and W. S. Williams; on membership—W. S. Williams, L. T. Griffiths, C. H. Badeau, M. Lauterbach, G. L. Ring, D. S. Anness, M. E. De Aguerre, J. F. Sadler and H. L. Kingsbury; on news and statistics—J. F. Strong, M. Lauterbach, W. A. Thompkins, A. F. Baldwin and J. H. B. Edgar; on complaints—H. R. Lounsbury, S. White, Jr., E. C. Abell, D. B. Mumford and D. S. Anness, with Mr. S. White, Jr., as chairman.

We have been accosted by fault finders who accuse us of eternally harping on the dullness of the market for mining stocks, and that our course has been instrumental in keeping away the public which generally prefer a lively market, and will not come in when things are quiet. It is our duty to chronicle the truth at all hazards. We cannot report a brisk market, when it in fact is a very dull one. Some brokers *imagine* that it is all right to "boom" the market by unfounded rose-colored reports, if only this will bring in a few outsiders to buy the stocks, we shall, however, continue to report the mining stock market as it is, and not as they or we would like to see it.

This week is but a repetition of the past few weeks, so far as dullness is concerned. As epigrammatically expressed by a prominent member of the Exchange, "the good stocks hold their own; the poor ones are '*in statu quo, ante bellum.*'" This may be tautological and the latinity may be hackneyed, but if the speaker meant that the poor stocks were as usual he is correct.

Minnesota Iron Company, at $86@$87.50, was dealt in to the extent of 410 shares.

Horn Silver shows transactions amounting to 4,400 shares at $3.30@$3.50. This stock is one of the few which attracts attention. Ontario turns up this week with 220 shares at $44@$45. 1,000 shares of Stormont sold at 7 cents.

Phœnix, of Arizona, has been well treated during the week. Sales aggregate 13,600 shares, starting at $1.35 and closing firmly at $1.50. Mr. Stephen R. Lesher, of the firm of Lesher, Whitman & Co., of this city, has been elected a director of the company. Mr. Lesher is well known in financial circles, and has established a reputation as a conservative business man. That he is interested in the Phœnix speaks well for the company. The management announce that news of interest to the stockholders will be made public within a fortnight.

On the whole we note an improvement in the Comstocks, more in prices than in the volume of business. Consolidated California and Virginia was stronger at $4.50@$4.80 with about the same number of sales as last week. Crown Point advanced from $2.90@$3.25. Gould and Curry at $1.90 was neglected. Hale and Norcross was not dealt in, and a solitary sale of Yellow Jacket was made at $3.50 an advance of 35 cents over last

week. Alta advanced from $1.35@$1.50. Chollar opened at $4.00 and closed at $4.90, a very fair advance considering that last week it sold at $3.10. Consolidated Imperial does not appear among the stocks traded in. Comstock Tunnel sold 4,000 at 18@20, no change over last week. Julia closed at 50c., an advance of 5c. Mexican, although quiet, found time to run up from $3.50@$3.85.

Potosi shows by far the greatest advance. The reports of the strike are, to say the least, rather vague but encouraging to those who pin their faith to these stocks. Potosi opened this week $7.13, and advanced to $7.50.

The Comstock Tunnel scrip sold at 25c.

Sutro Tunnel was neglected at 06 cents. Ophir sold only 100 shares at $4.90. Sierra Nevada advanced from $2.90 to $3.45. There was only one sale of Scorpion, at .40 cents.

Of the Tuscarora stocks Belle Isle sold at from 60@80 cents.

Navajo at 40 at 50 cents.

Eureka was stationary at $4.

El Cristo was more active this week at $1@$1.20.

San Sebastian appears once more, with two sales at 30. and 25c.

Rappahannock, at from 4 to 6 cents., managed to sell 12,500 shares. We understand the company has been repairing its plant, and that, this once done, it will start work.

We note but one sale of the copper stocks. Boston has a monopoly in these, and try as it might, New York does not appear to be able to wrest the supremacy from "the Hub." Allouez at $7.25, sold 100 shares.

Of the Black Hills stocks Caledonia was fairly active at $2.00. Deadwood Terra, $1.35@$1.50, was quiet.

Brunswick Consolidated seems to have struck a descending gait. It opened at $1.25 and closed at $1.

Astoria at 4 cents managed to dispose of 3,300 shares. Sutter Creek was quiet at $1.40@$1.50. Excelsior at 84c. was neglected.

Quicksilver preferred sold at $41.75@$43.75, and common at $8@9.50.

Standard Consolidated has levied an assessment of 50 cents per share, delinquent July 15th.

Plymouth was a visitor to the floor this week, selling at $8@8.25. A telegram at the office of the company here is to the effect that an ore body about 300 feet in length has been encountered in the Indiana ground, and that it is considered an important strike. The ore will mill about $10 per ton.

Of the Colorado Stocks Monitor was let alone. Leadville Consolidated shows moderately large sales at 11@12c. Adams has a solitary transaction at 9lc. Chrysolite was traded in at 30@40c. Friedland visited the market, starting at 85 and closing at 60c. Iron Silver at $2@$2.05; Little Chief at 31@33c.; Silver Cord at 45@55c.; and Small Hopes at 92c. were all in good demand this week.

Silver Mining of Lake Valley after an absence of some weeks reappears stronger than when last traded in. One thousand shares at 42@43cts. were disposed of to-day.

We note sales of the Ruby Silver Mining Company's bonds, which have been placed on the permanent list. The only other mining bonds on the list are the Comstock Tunnel's. Somehow or other the investing public has never been partial to the bonds of mining companies; 500 at 102 and 1,000 at 102½ are reported. The company is said to own Kansas City real estate, which will enable it to pay the interest when due. It is the general impression that these bonds are being bought outside by the stockholders or their friends.

Alice Gold and Silver Mining Company of Montana has declared its 24th dividend of $25,000, or 6¼c. per share, payable July 1st. The stock continues to excite interest. The transactions for the week sum up 3,800 shares at $2.50@$2.75. Moulton had a solitary sale at 60c. It is reported that next fall Wall Street Mining and Milling Company will begin a career of activity. To do this it must be a good property, and not only this, it should be able to show good reports based on something more substantial than the mere statement of some remote and unknown superintendent. Whether the company is able to do this it alone can determine.

Denver. June 9.

(From our Special Correspondent.)

The past week has been rather quiet, but at times exciting. The Clearing House arrangements has been a "bomb" of what will prove of great benefit to the future of this, as well as all other western Exchanges, which we prophesied some time ago would be the outcome of *the success* of this. There has been a "weeding out" not only of brokers but in systems, a general drop in fictitious prices, and a more careful inquiry into the values of the mines and prospects.

Investors are inquiring and are anxious to know how much of treasury stock money has been or will be expended upon the different prospects now listed, and what the prospects really are for some future dividends, or for a rich strike. It is fully time that some show, in some locality, was made for this large amount of *developing fund* that most surely was paid in for that purpose. It is to be hoped that there will be an advance all along the line in prices, as many holding small blocks can ill afford the losses occasioned by the drop.

General confidence is being restored gradually and the offerings of the Exchange are each using extra precaution, and labor for future permanency and success. The listing and selling of some of the best stocks in eastern markets will greatly assist them, and, as we now understand that preparations are being made for that purpose with three or four well-known miners, the outlook is encouraging.

Vice-President Warder, of the Kansas City exchange, is in the city. He says the Kansas City exchange could not get along without Denver, and that market is following Denver in every feature. A bear movement here causes a depression there, and a bull movement in Denver is followed by an advance in Kansas City.

Prices and sales during the week ending June 7th, 1890:

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo	25b	*30a	25	27a	100
Amity, Colo	08½b	*13a	05	06	2,700
Bangkok, C. B., Colo	08b	*16	08	13	16,900
Bates-Hunter, Colo	35	40	35	40	20,700
Brownlow, Colo	12b	*14	12	13b	3,100
Calliope, Colo	45	46	43½	42b	2,600
Cash	27½	29½	27	29½	6,100
Clay County, Colo	40a	23	23	25a	100
Hard Money, Colo	09a	08	05½	04b	5,700
Little Rule, Colo	49a	*52	48	*52	9,800
Matchless, Colo	200a	....	....	400a	....
May-Mazeppa, Colo	65	*70	65	69	25,500
Mollie Gibson, Colo	50a	....	..	60a	.....
Oro, Colo	600b	....	....	600a	.....
Pay Rock, Colo	06¼b	06¼	04½	05¼	19,000
Puzzler, Colo	21a	15	11	15b	700
Reed-National, Colo	66	70	66	69	1,800
Silver Cord, Colo	40a	.	....	50a	....
Whale, Colo	20b	22	19	*26	2,000
PROSPECTS.					
Argonaut, Colo	16b	....	...	16½b	....
Aspen United, Colo	08b	10	07	08¾	3,200
Big Indian, Colo	15a	12½	12	11	400
Big Six, Colo	13a	10	10	10	1,400
Claudia J., Colo	10a	07¼	06½	07¼	2,100
Nat. G. & Oil, Colo	‡22	‡30	‡21	21½b	14,700
Diamond B., Colo	12a	‡11	04½	*08½	10,400
Emmons, Colo	*20b	*18	15	13b	700
Golden Treasure, Colo	20a	15	13	14b	500
Ironclad, Colo	23½b	*25½	23	23	3,900
John Jay, Colo	23a	20	15	15	1,100
Legal Tender, Colo	06b	*07	05½	06	5,800
Morning Glim, Colo	50b	50	50	50	4,300
Potosi, Colo	20a	16	11	13	1,700
Rialto, Colo	12a	*12	06	*12	20,900
Total for the week					191,900

*Buyer 30 days †Buyer 60 days. ‡Seller 60 days.
§Seller 30 days. a Asked. b Bid.

Boston. June 12.

(From our Special Correspondent.)

The boom in copper stocks continues, and the demand for this class of securities is growing daily. Almost every one is desirous of taking a hand in the speculation, and prices advance with apparently little effort. There is good reason for the activity, as ingot copper is growing stronger every day, and the demand is unabated, while the production hardly keeps pace with the demand. This means large dividends to holders of the producing mines and stimulates efforts of the numerous other mines to put their several properties upon a paying basis. Calumet & Hecla with its enormous production, with copper at 16c. per pound, must inevitably pay larger dividends than ever, and it is no wonder that the stock is wanted even at $320, which is the price it sold at this week, and there is not much to be had at this price. Our prediction that it would sell at $350 in 1890 bids fair to be realized. Tamarack is fast climbing the ladder to $250, selling this week at over $200. A $5 dividend in October is quite likely to be forthcoming, and we see no reason why it should not be permanent.

Quincy has astonished even its friends by the rapidity of its advance. A few weeks since we said it would sell at $120 this year; to-day it sold at $132, the highest price we recall since the war. There is a possible dividend of $5 in August, from rights on the 10,000 share treasury stock.

Boston & Montana sold up to $68 this week, losing a portion of the advance and recovering to $67. The silver product in May was over 24,000 ounces, making a total for 11 months to May 31, of 258,448 ounces. A dividend of $1.50 per share is confidently expected in August.

Butte & Boston advanced to $26¼, but was a little heavy to-day, declining to $25½.

Franklin declined to $19 on account of the determination of the directors to pass the July dividend, but it dawned upon the sellers that the property was improved rather than injured by the decision, and so they concluded to buy their stock back, in doing which the price advanced to $22, and is firmly held at that figure.

Centennial and Kearsarge seem to have come to a halt, both stocks selling during the past week in a small way at $37 to $38 for the former, and $20½ to $23 for the latter. To-day, after the noon hour, there was a batch of fresh orders to buy these stocks, and Centennial advanced to $40 and Kearsarge to $25. They are both properties of great merit, and will prove themselves such ere the present year closes.

Osceola advanced from $39 to $47, and will no doubt sell much higher when the new shaft is in operation, which will be in July. It is computed that with copper at 16c. the mine can easily earn $100,000 per quarter—equal to $2 per share on the stock. It ought to sell at $75.

Central has advanced to $25, and there is rather more disposition to trade in it. The market for the small producers, such as Allouez, Arnold, Huron, Copper Falls and others, is strong, and prices are daily advancing. We expect to see a large and active business in all the coppers this summer and fall, and the small fry, such as Aztec, Hanover, Hungarian, Dana and a host of others, will come in for their share of the deal. The transactions in this class are daily increasing, and good profits are possible.

A new Stock Exchange has been started in Boston for the purpose of dealing in mining and other stocks. Members of the old Mining Exchange have joined forces with the new effort, and the outlook for a successful business is very encouraging. The Exchange has taken suitable rooms on Exchange place, and already numbers fifty members, and applications for membership are coming in rapidly.

The market closes strong.

By Telegraph.—Osceola, $47¾; Montana, $67½; Tamarack, $209; Centennial, $40; Kearsarge, $26½, Quincy, $130½; Calumet & Hecla, $319; Franklin, $22; Butte & Boston, $26; Arnold, $1.85; Huron, $6; Pewabic, $12½; National, $3.

Helena, Mont.

A quiet movement looking to the organization of a mining exchange has been on foot in this city for some time past, and on the 3d inst. articles of incorporation were duly filed with the Secretary of State. The incorporators are: H. M. Parchen, A. J. Seligman, L. G. Phelps, R. C. Wallace, E. D. Edgerton, John T. Murphy, A. M. Holter, Charles K. Wells, E. W. Knight, O. R. Allen, Thomas Cruse, Henry Klein and Samuel Word.

Kansas City. June 9.

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut	19½†	18	15	15	20,900
Bates-Hunter	39	39½	39	39½	17,700
Big Six	5‡	..	..	..	.....
Brownlow	40‡	..	..	16	.....
Cash Gold	28½	29	28½	29	700
Clay County	35	35	35	35	100
Diamond B	6½*	6½	5	5	200
Hard Money	5‡	..	..	10†	.....
Iron Clad	23†	..	..	15‡	.....
King Jack	..	..	..	..	.....
Little Nugget	79‡	..	..	79½‡	.....
Little Rule	50	50	50	51‡	100
May Mazeppa	67½	68	67½	68	25,500
Minnequa Zinc M. Co	25½	27*	25	25½	9,800
Monte Cristo	10	12*	9½	12*	1,700
Morning Glim	50½	50½	50	50	4,400
Pay Rock	8†	8	3	3‡	.....
Pelican	29½*	30	29½*	30	5,100
Potosi	12	12	6‡	6‡	500
Sylph	..	..	..	..	.....
Total					86,700
Pit sales					100

† Bid. ‡ Asked. * Buyer 30. § Seller 30.

Minneapolis. June 10.

Company.	Bid.	Asked.
Algoma	....	1.00
Amazon Iron Mg. Co	.	$3.50
American Ruby Mg. Co	.18	.25
Argenta S. Mg. Co	....	.75
Badger Silver Mg. Co	4.85	....
Bessemer Consol. I. M. Co	...	2.00
Big Ox Mg. & Rec. Co	1.65	2.00
Black Hills Tin M. Co	1.25	1.50
Deer Lodge Mg. & Sm. Co	.11	.20
Derwood Con. Mg. & M. Co	....	....
Dot Iron Mg. Co	....	1.50
Glengary S. Mg. Co., Mont	....	....
Gogebic Iron Co	2.00	3.50
Iron Duke Mg. Co	....	....
Keystone Mg. Co	.20	1.00
North Pabst I. Mg. Co	.12½	.16
N. W. Coal Mg. Co	2.70	3.25
Phoenix Iron Works	32.50	36.00
Rochester M. & M. Co	.12½	.25
Silver Arrow	.09½	.10
Silver Crown Mg. Co	....	.30
Silver King Mg. Co	....	1.00
Thunder Bay G. & S. M Co	....	.9[illegible]
United Iron & Land Syndicate	....	3.00
White Spar Mica Mg. Co	....	*1.50

* Actual sales.

Salt Lake City.

The Salt Lake Stock Exchange was formally opened on the 5th inst. Feeling the necessity of having some place where the mining man, the prospector and the capitalist could meet together, those interested came together and decided to form an exchange that would meet the wants of all. There were a few preliminary meetings held, and the support received was so encouraging that articles of incorporation were filed and the institution put on a sound financial basis. The membership was limited to one hundred, a meeting was called, and officers were elected as follows: President, R. C. Chambers; Vice-President, N. Trewesk; Secretary, E. O. Horn; Treasurer, J. W. Donnellan.

These gentlemen, with J. J. Daly, George M. Scott, A. Hanauer, William Babcock, Jr., W. F. James, S. Bamberger, W. W. Chisholm and C. S. Davis, comprise the directory.

Stock listing committee: E. P. Ferry, C. E. Michener, H. C. Wallace, A. E. Hyde and A. F. Holden; finance committee: R. C. Chambers, J. W. Donnellan, E. B. Wicks, H. Hirsching and Lewis Martin. Suitable quarters were obtained, and rules governing the listing of stock were prepared, with the view of affording all necessary aid to any legitimate enterprise, and preventing the floating of any wildcat scheme at the expense of the investing public.

Telegrams of congratulations were received from

various sources, among others from the Colorado Mining Exchange.

The following mining companies are on the list, Ontario, Daly, Anchor, Alliance, Apex, Crescent, Park City Mining Company, Rochester, Barnes Sulphur Company, Horn Silver, Alice, Bellevue, Glencoe, Woodside, Camas No. 1, King of the West, Mammoth, Malad Consolidated, Centennial Eureka.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co.	$25.00	$55.00	$65.00
Aurora Iron Co.	25 00	7.50	8.00
Champion Iron Co.	25 00	90.00	95.00
Chandler Iron Co.	25.00	37.00	38.00
Chapin Iron Mining Co.	25.00	30.00	33.00
Chicago & Minn. Ore Co.	100.00	110.00	115 00
Cleveland Iron Co.	25.00	18.00	18.50
Germania	25.00	11.50	12.00
Jackson Iron Co.	25.00	110.00	....
Lake Superior Iron Co.	25 00	67.00	68.50
Milwaukee Iron Co.	25.00	5.50	6.50
Minnesota Iron Co.	100.00	83.50	85.00
Montreal Iron Co.	25.00	9.00	10.50
Norrie (Metropolitan)	25.00	70.00	75.00
Odanah Iron Co	25.00	20.00	22.00
Pittsburg Lake Angeline Co.	25.00	170.00	175.00
Republic Iron Co.	25.00	43.00	43.50

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co.	....	....	....
Grayling Gold & Silver Co.	$25.00	....	....
Michigan Gold Co.	25.00	$1.25	1.50
Peninsula Gold & Silver Co.	25.00	....	....
Ropes Gold & Silver Co.	25.00	2.25	2.50

* Actual sales were made at these prices.

PIPE LINE CERTIFICATES.

[Special Report by Messrs. Watson & Gibson.]

On Friday and Saturday of last week there was the same general apathy in the petroleum market which had previously characterized it for quite a period, but on Monday it showed a decided strength, and it has begun to be the general belief that the late purchases by the Standard Company of a considerable portion of the producing territory in the State of Pennsylvania will exert a tendency to advance the prices of certificates.

The May report of the National Transit Company is bullish. It shows a decrease of 137,134 barrels in net stocks, made up by an increase of 650,519 barrels in credit balances and a decrease of 787,953 barrels in certificates outstanding. This heavy decrease in certificates would naturally point to a better market for them, although we do not anticipate any extravagant advance.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 7	86⅛	86⅛	86¼	86⅜	59,000
9	86	90¼	86	89½	196,000
10	91⅛	91¾	89⅞	90	179,000
11	89¾	89¾	8¾	89	146,000
12	89	89½	88½	89½	115,000
13	89⅝	90	89¼	89⅜	81,000
Total sales in barrels					776,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 7	87¼	87¾	87	87¾	12,000
9	86¾	91½	86¾	90¾	158,000
10	91	91¾	90⅛	91¾	91,000
11	91¼	91¼	89⅝	90⅝	125,000
12	90	90⅞	89¾	90¾	40,000
13	91	91⅜	90⅛	90¼	132,000
Total sales in barrels					558,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 13.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending June 7th, 1890, compared with the same period last year:

Regions.	June 7, 1890.	June 8, 1889.	Difference.	
Wyoming Region	Tons	403,026	367,258	Inc. 35,768
Lehigh Region	"	131,810	117,566	Inc. 14,244
Schuylkill Region	"	246,589	130,397	Inc. 116,192
Total		781,425	615,221	Inc. 166,204
Total for year to date		12,669,846	12,855,903	Dec. 186,057

PRODUCTION OF BITUMINOUS COAL for week ending June 7th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890.		1889.
Tons of 2,240 lbs.	Week.	Year.	Year.
Phila. & Erie R.R.	1,946	54,580	34,055
Cumberland, Md.	‡82,326	1,679,084	1,258,942
Barclay, Pa.	‡2,767	61,980	49,503
Broad Top, Pa	8 329	332,576	162,370
Clearfield, Pa.	76,687	1,739,801	1,263,214
Allegheny, Pa.	21,933	595,491	381,817
Beach Creek, Pa.	50,376	860,185	561,467
Pocahontas Flat Top	34 000	867,235	648,056
Kanawha, W. Va.	‡42 701	916,836	668,105
Total	321,063	6,981,856	5,027,529

WESTERN SHIPMENTS

Pittsburg, Pa	12,439	397,694	252,939
Westmoreland, Pa.	5,760	684,206	616,020
Monongahela, Pa.	13,616	155,373	99,848
Total	31,815	1,237,273	968,807
Grand total	352,878	8,219,129	5,996,336

‡ Estimated.

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending June 7th, and year from January 1st, in tons of 2,000 lbs.: Week, 98,918 tons; year, 2,290,449 tons; to corresponding date in 1889, 1,933,816.

Anthracite.

Very little if any significance seems to be attached by the anthracite coal trade to the recent proceedings of miners and mine laborers at St. Clair. They met in large numbers, and passed a set of resolutions condemning the action of the Schuylkill Coal Exchange in ordering a reduction of 10 per cent. in wages as "unjust and uncalled for," and "infamous," in the face of the June increase and expected July increase in circular prices. They conclude in words which are intended to incite to a strike, and they threaten to appeal to the Federation of United Mine Workers. But it is all based on a natural misunderstanding, which, it is expected, will be made clear to the men without loss of time. June prices are yet, for the most part, *in futuro*. Very little has yet been sold at June prices.

Intelligent buyers who have watched the market have all bought pretty liberally at May prices, and at the present moment they are at the hesitating point about buying more. The consequence is that we hear of considerable stocks accumulating, and a very dull, flat market. "Nothing new doing" is the general complaint, and there is a good deal livelier demand for June and July vacations than for June coal.

The expectation that by July 1 the market will about correspond with the July market of last year, as far as tonnage is concerned, seems to be well founded. But the country should take a great deal more coal this fall than it did last fall, if the indications are reliable. The May over production of 500,000 tons will doubtless be repeated in June, though prices are generally lived up to. No one will admit dealing at lower than circular rates; but during this particular dull period any sale large enough to attract notice is looked upon with some degree, if not exactly of suspicion, at least of curiosity, and operators are pretty ready to hint that list prices are being generally shaded to secure business.

Prices remain: Stove, $3.75; chestnut and egg, $3·50; broken, $3.35.

Bituminous.

Ice is now more than ever an important factor in the bituminous coal market. Philadelphia ice dealers have very little ice on hand, and New York ice dealers have monopolized all available boats. The result is that freight for shoal water ports at Philadelphia have advanced yet another 15 cents, making it now $1.70 for a short ton of ice where it was 60 cents for the corresponding period last year. The bituminous coal operators are consequently at their wits' ends for boats and are constantly scouring round for captains who will carry a long ton of coal for considerably less than a short ton of ice—and with the ice always ready and the coal often delayed.

The New England demand for bituminous seems to be moderating a little. Coal has been going forward very freely and stocks are quite as full as they should be to keep a firm market. Added to this, there is good ground for believing that the Reynoldsville strike will be concluded by the time these lines are printed, and this will materially increase the output just when it is not wanted. In other respects the production of the past few weeks has not been much over the contract demands.

There is nothing whatever to record in the market for the week except that the some-time expected boomlet is very conspicuous by its absence.

Prices, by agreement, remained unchanged: At Baltimore, $2.40@$2.50 f. o. b.; Philadelphia, $2.50 @$2.60 f. o. b.; in New York harbor, $3.25 f. o. b., alongside, $3.50.

The protracted rate-cutting war between sixty odd Harlem coal retailers has been happily stopped through the exertions of several members of the Retail Coal Exchange. A uniform scale was adopted at a meeting this week, which will go into effect on July 1st.

The Retail Coal Exchange is rapidly gaining in membership, and is about to erect a $40,000 exchange building of its own. Mr. Ehrenreich, who has been very active in the matter, also proposes to start a life insurance adjunct when the new exchange is completed.

Boston. June 11

(From our Special Correspondent.)

The anthracite coal market is very quiet in jobbing circles. The companies hold firmly to prices of the last advance, and retailers hold just as firmly out of the market. There is some talk of another advance July 1, and it is not improbable that such a move will be made. If the trade becomes convinced that prices are to be marked up again, there will be some trade in the last ten days of the month, but otherwise the amount of new anthracite business for June will be very small. There is some delay in shipping new orders, as owing to the big amount of coal to come forward on old orders, and the recent restriction, coal does not come down to tide very fast.

The bituminous branch of the coal market is without notable features. I hear of a contract for 15,000 tons being placed this week which was commonly supposed to have been placed long ago, but as it went to the same parties as last year the transaction is not significant. There is a very fair jobbing trade for bituminous in small lots. Prices are now lower than they have been, and are, if anything, a little stronger; $2.40 f. o. b. is outside for Cumberland coal, and $2.25 @ $2.30 for Clearfield.

The freight situation is unsatisfactory. Vessels are just now scarce at all points but New York, where the rate is 75@80 cents. There are no vessels at Baltimore. The rate there is nominally $1.30. At Philadelphia there have been a few vessels this week at $1.15@$1.20. A good many vessels have been unloading coal here this week. The outlook for any marked reduction in freights is not considered good.

The retail trade is still in an unsettled condition. The war of rates in bituminous coal has driven the Pocahontas jobbers to a point where they do not hanker for business. Good Cumberland coal can be had for $3.75, delivered, 2,000 lbs. This is scarcely cost. The cut rates in anthracite have not gone to quite such an extent, but there is more cutting, perhaps, than there was a week ago. The nominal price list of the combination has been reduced within a few days to the following, for 2,000 lbs. delivered: free burning stove, $5.50; nut, $5,75; egg, $5.25; broken, $5.50; Franklin, $7; Lehigh furnace, $5.25; egg, $5.75; Cumberland, $4. Several dealers are said to be selling 25 cents below these prices on most all sizes. If something is not done soon, the combination will be a rearrangement of the past.

Buffalo. June 12.

(From our Special Correspondent.)

The anthracite coal trade quiet at unchanged quotations with few items of any interest to the general public.

The bituminous trade moderately active, with prices nominally without variation, but occasionally a small cut is made to equalize a car demurrage. Those engaged in the business anticipate a fair season's trade at living rates and some few dollars over. Supply fair and equal to present requirements.

Coke quiet and steady; prices on cars for Connellsville per 2,000 lbs., $4.70 for foundry and $4.90 for crushed.

The monthly meeting of the Western New York Car Service Association was held yesterday. The difference in time allowed for unloading anthracite and bituminous coal was first discussed, and the following resolution adopted, to take effect July 1, 1890:

Resolved, That the second paragraph of Article IV. of the Articles of Agreement be changed to read: "It is agreed that the charge of $1 per day shall not begin on cars loaded with coal and coke until 24 hours have elapsed after the usual 48 hours allowed for unloading."

Heretofore anthracite coal was given five days to unload, and under the new rule will be cut down two days, while bituminous coal and coke will get the benefit of 24 hours additional for unloading. This action will remove one of the greatest stumbling blocks the association has had, and will put all kinds of coal and coke on the same basis.

Manager Van Etten asked that the association interpret Rule 5, and to that end the following resolution was adopted:

Resolved, That the meaning and intent of Rule 5 is as follows: "Cars containing coal or coke shipped by any member of this association to its regular authorized agent will not be subject to car-service charges while on its own roads or tracks, or on the private tracks of its agents."

Outside town's branches were reporting that the system was working now very satisfactorily, and but little friction was manifested.

It is estimated that 1,000,000 tons of bituminous and 350,000 tons of anthracite coal were consumed in this city for all purposes during the year ending May 1st, 1890.

The papers and maps for the Buffalo Dock and Connecting Railroad Company have been filed with our County Clerk. The promoters ask the State for the use of the berme bank of the Erie Canal where necessary for the line, so that canal boats may be loaded direct from the cars or *vice versa*. The idea is to make a kind of belt line, to be used by the Lehigh Valley, the Grand Trunk, the Michigan Central, the Erie, the Canadian Pacific (when completed to this port), and other railroads, the banks of the canal to be maintained and kept in repair without cost to the State.

The next meeting of the Western Anthracite Committee will be on the 26th instant in New York city.

The news from Chicago, St. Paul and some other Western and North Western points indicates that business is only moderate, with slight prospects of improvement in the near future.

Bids for supplying the Buffalo School Department with about 4,500 net tons anthracite coal were opened Monday; 16 firms offered grate at $4.50, and egg, stove and chestnut at $4.75 delivered. Messrs. Loomis & Co.'s prices were $3.79 and $3.97,

and Mr. Phillip Groben, $4.15 and $4.40 respectively. The award has not been made yet.

Lake freights firm at unchanged rates.

The shipments of coal hence by lake from June 5th to 11th, both days inclusive, aggregated 45,110 net tons; namely, 25,790 to Chicago, 6,300 to Milwaukee, 3,000 to Duluth, 3,150 to Superior, 2040 to Toledo, 380 to Marine City, 1,900 to Detroit, 400 to Saginaw, 650 to Windsor, 900 to Sault Ste. Marie and 600 to Menominee; total thus far this season, 406,380 net tons. The rates of freight were: 60c. to Chicago and Kenosha; 50c. to Milwaukee, Sault Ste. Marie and Menominee; 40c. to Saginaw; 35c. @30c. to Detroit, Toledo, Windsor and Marine City. Coal receipts by canal for first week in June, 542 net tons; shipments, none.

Pittsburg. June 12.

(From our Special Correspondent.)

Coal.—We have nothing new or important to report concerning coal, as regards prices or demands. The season is nearing its end. Unless there is a rise in the Ohio, the mines will soon be closed down, except in a few instances, for local sales. The lower markets have all they want for months to come.

Nominal rates in pools:

	Per 100 bushels.		Per 100 bushels.
1st pool	$4.75	3d pool	$3.90
2d pool	4.50	4th pool	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—Rapid increase in shipments. Reports from the Connellsville region show a decided improvement in trade. The total shipments for the week were 13,310 tons, or about 12,000 tons in excess of the preceding week. The increase is partly due to the fact that furnaces and foundries which have been experimenting with new cokes, made in other districts, have found them wanting, and are now drawing their full requirements from the Connellsville region, and partly to the improvement in the pig iron market and the "blowing in" of furnaces that have been out of blast for repairs. Indications are very favorable for still further increased shipments. Prices are firm at the following figures, f.o.b cars at ovens: furnace coke, $2:15; foundry, $2.45; crushed, $2.65, all per 2,000 pounds. Freights to all points are unchanged.

FREIGHTS.

From Philadelphia to: Boston, *1.05@*1.10; Gardner, *1.10; Gloucester, *1.10; Lynn, *1.15; Naponset, 1.15½; New York, †90; Rockport, *1.30; Washington, †85.

From New York to: Albany †35; Bangor, *75; Bath, *80; Beverly, *75; Boston, *.75; Bristol, §75; Bridgeport, §60; Brooklyn, †20; Cambridge, * 75; Cambridgeport, *75; Charlestown, *75; Chelsea, *75; Com. Pt., *80; East Boston, *75; East Cambridge, *75; East Greenwich, §75; Fall River, §75; Gardner, *.85; Gloucester, *85; Hudson, †.35; Lynn, *90; Marblehead, *.85; Medford, *1.10; New Bedford, §75; Newburyport, *90; New Haven, §60; New London, §75; Newport, §75; Norwich, *70; Norwalk, §60; Portland, *.75; Portsmouth, N. H., *.80; Providence, §75; Quincy Pt., *80; Rockland, *85; Rockport, †75; Roxbury, *75; Saco, *90; Salem, *.75; Troy, †35.

From Baltimore to: Bath, 1.30; Boston, Mass., 1.30; Brooklyn, 1.10; Charleston, .70; Fall River, 1.20; Galveston, 3.25; New Bedford, 1.20; New Haven, 1.20; New London, 1.20; New York, N. Y., 1.10; Portland, 1.30; Portsmouth, N. H., 1.30; Providence, 1.20; Quincy Pt., 1.40@1.45; Salem, Mass., 1.30; Savannah, .90; Somerset 1.25; Williamsburg, N. Y., 1.10@1.15.

*And discharging. †Alongside. ‡And towage. §Flat.

METAL MARKET.

NEW YORK, Friday Evening, June 13.

Prices of silver per ounce troy.

June	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	June	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
7	4.86	48	1.04⅛	11	4.87	48¼	1.04⅛
9	4.86	49	1.05¼ 1.05¼	12	4.87¼	48	1.04
10	4.86	48¼	1.05⅛	13	4.87⅛	47¾	1.04¼

The silver market has continued irregular upon more or less favorable reports from Washington, and closes at about same figure as opening last week.

Bullion silver certificates now outstanding	5,176
Ounces deposited with Mercantile Safe Deposit Company	5,179,965

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
June 7	106¼	105	275,000
June 9	106	105⅛	230,000
June 10	106	105¾	135,000
June 11	105	104¼	196,000
June 12	105	104	270,000
June 13	105	104	100,000
CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.			
June 10	106		10,000
June 11	105		10.000
June 13	105		10,000
Total sales			1,236,000

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in ts rate for discount, and it remained at 3 per cent. During the week the bank gained £170,000 bullion, but the proportion of its reserve to its liabilities was reduced from 42·67 to 41·80 per cent., against an advance from 40·77 to 42·63 per cent. in the same week last year, when its rate for discount was 2½ per cent. The bank on the 12th inst. lost £250,000 bullion on balance. The weekly statement of the Bank of France shows losses of 750,000 francs gold and 1,075,000 francs silver.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars	$ .78	$ 81
Mexican dollars	.80	.81½
Peruvian soles and Chilian pesos	.73½	.75½
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.87	4.90
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	104⅛	105⅝

Copper.—As we fully anticipated: the advancing movement in copper prices has made further progress during the past week, and this time the lead has been taken in Europe, where a very large amount of business has been done during the week. In London Chili Bars and G. M. B. copper opened last Monday morning at £58 10s. to £58 12s. 6d., spot, and £59 to £59 2s. 6d, or an advance of more than £2 upon the closing prices of the previous week with a very active business, and the lowest figures touched during the whole of the week were within 10s. to 15s. of these opening prices, the latest quotations at the close of the market to-day (Friday) being £58 7s. 6d.@£58 10s. spot, and £59@£59 2s. 6d. three months. The stocks of Chili bars and G. M. B. copper warehoused in England are understood to be very light, the great bulk of such stocks being now stored in France. The sale of the previously undisposed balance of French bankers' holdings of Anaconda matte has been announced at 11s. 6d. to English smelters, the quantity being about 10,000 to 12,000 tons, and the price realized is a comparatively favorable one for the buyers. Refined and manufactured sorts are also much firmer in Europe, and quotations have improved considerably, the latest being English tough, £61 5s.@£61 10s.; best selected, £62 15s. @£63; strong sheets, £68 10s@£69, but at these prices buyers are more numerous than sellers.

Consumption is undoubtedly going on at an enormous rate, both in Europe and in this country The representatives of the French holders in this country have sold about a million pounds of Lake copper during the week at 15¾, and nothing can now be bought in that quarter below 16, and it is understood that the quantity they have left for disposal is now comparatively small.

Although the Lake companies have recently been selling at the last-named price, they are no longer offering thereat. The closing quotations may be given as 16c. for Lake brands, 14¾ to 15c. for Arizona and 13¾ to 14c. for casting sorts. Quotations for the casting brands are, however, rather irregular, the strong demand being more for the finer sorts, which, however, naturally affects the prices of all kinds.

The exports of copper during the past week were as follows:

To Liverpool.	Copper	Lbs.	
S. S. City of Rome	64 bbls.	113,183	$14,000
" " " "	119 casks.	117,675	15,000
" Armenia	84 casks.	100,800	8,500
To Hamburg.	Copper matte.	Lbs.	
S. S. Augusta Victoria	1 case.	250	25

Tin.—The market opened very strong at the beginning of the week, and on Wednesday the growing interest culminated in the largest single transaction ever recorded in this article on the New York Metal Exchange—namely, the sale by a prominent importing house in this city to a well-known operator of 250 tons June delivery and 250 tons July delivery (500 tons in all), at 21¾c. Since then the London market has eased off a little, probably were in sympathy with the unsettled silver market than because of any real weakness, and this has had its usual effect on our home market. The latest London quotations are: Spot £9 7s. 6d.@£96, and futures £96 5s.@£96 7s. 6d or about £1 below the highest figures touched during the week, but still showing an advance of about 10s. since last week. Prices in this market will, it is expected, be firmly upheld as the quantity of the metal available is considered hardly enough to meet the consumptive demand which is really going on at a very great rate. Our closing quotations are Spot, 21⅝; June, 21⅝; July, 21½.

Lead.—After an interval of about a fortnight of dullness and inactivity, a very active demand has sprung up, and the eagerness of buyers clearly proves that their supplies are getting very low. The Western refiners are not at all anxious to sell, in spite of the higher prices obtainable, and quotations have naturally improved accordingly to 4·40@4·42½ for spot and June delivery, with the general tendency very firm. Cables from London also report the market firm there, and the latest quotations are: Spanish, £13 2s. 6d.; English, £13 7s. 6d.

The Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "Following the lead of New York, values have steadily hardened during the week, and the closing is very firm at 4·30 cents asked. Owing to light offerings by refiners sales have been limited, and probably will not be over 300 tons."

The St. Louis Lead Market.—Messrs John Wahl & Co. telegraph us as follows: "Lead is strong and has an elevating tendency. Owing to the scant offerings, transactions have been light. Buyers show a fair amount of desire to procure the metal, and they find it not an easy task to be supplied liberally at market rates. Sales probably sum up 600 tons at from 4·15 to 4·20c."

Spelter continues very firm, and producers seem to be entirely sold out for June and July, and are not offering for later deliveries. In the absence of important business, we have to quote nominally 5·55@5·65. In London there has been an advance of about 10s. during the last fortnight, and the present quotation for ordinaries is £23 7s. 6d.

Antimony.—As stocks are absrlutely exhausted and nothing is therefore available for spot delivery, the market naturally continues very firm. We quote Cooksons 24@24½c., and Halletts 20½@ 21c., but for delivery at the end of the month it can be purchased cheaper.

Nickel.—There does not appear to be very much inquiry for nickel, and the metal is quoted at 70@ 75c.

Quicksilver.—The London quotations are £10 10s., and for New York, $55. The receipts are small and it is held very firmly.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 13.

A tolerably firm dullness characterizes the whole market. Large transactions generally are few and far between, as usual at this season, but the absence of large stocks and the steady consumption impart a firmness of tone which leads to expectation of an early stiffening and rising market.

The West is reported to be buying much more freely of late, which is reflected in a comfortable and easy feeling here. However, the assertion in this connection, made in several quarters, that Southern furnaces are holding out for higher prices because of the Western demand, is hardly supported by the very general impression that they are placing much of their new iron in warrants. There have been several large transactions in these warrants reported on the Consolidated Exchange during the week, and it is asserted by representative men here that these warrants do not entirely represent old iron, but that much of it is of recent make, stored to prevent the impression of any lack of orders. If the experience of last winter is worth anything to those who speculated in these warrants and found themselves some $2 a ton or more out of pocket, a boom in iron-paper is scarcely to be expected.

Pig Iron.—If there is any change in this market since last week, it is for the better, though in no way evidenced in prices. All concerned agree that the market is firmer, considering the time of year, if only in maintaining its position. There is an expectation in certain quarters that some Western men will be placing orders here before the fall activity sets in, but this will hardly have any effect on the trade, as such transactions will be unusual and abnormal. They would indicate rather a temporary demand for certain kinds than the effect of a possible rise in Southern iron, at all events, as long as Southern iron is quoted and sold here. Consumers are inquiring so freely as to indicate that stocks are running down. Some market reports quote Northern brands 50 cents higher than we do, but at our prices all the iron desired can be secured without much dickering, and a large order might induce a shading of 25 cents. One Pine street firm sold 1200 tons No. 1 Northern during the week on the basis of $18 at tidewater. Quotations remain: Standard Northern iron, No. 1 x foundry, $18; No. 2, $17: Southern, No. 1, $16.75 @$17.50; No. 2, $16@$16.50.

Scotch Pig.—During the week no one claims to have made any sales worth recording. As the arrivals remain moderate prices hold their own. Though holders are firm, in the absence of a lively demand, the prices given below might be cut a trifle for any considerable transaction. Nominal quotations are: Eglinton, $19; Dalmellington, $22; Summerlee, $23.50; Coltness, $24@$24.50.

Spiegeleisen and Ferromanganese.—There is neither any change in nominal quotations nor any dealings to note for the week. For 20% spiegeleisen $31.50@$32 is asked, and for 80% ferromanganese, $77@$80 Whether these prices would stand the test of any orders greater than the little current demand is a moot point. There is plenty of both articles offering on the other side, but at present on a basis which would not permit any considerable reduction from above quotations.

Steel Rails.—Inquiry for steel rails is on the increase, and lowest prices have stiffened 50 cents, though the high limit remains as it was at last writing. Feeling is confident and firm, with

nothing apparently more tangible to justify it than expectation, some of which looks westward. The quotations of last week, $30@$31 are now modified to $30.50@$31.

Rail Fastenings.—The slight advance in old rails to $24.50@$25 has had some little effect on the trade, which remains inactive. Spikes have stiffened a little, and Eastern dealers are firm in demanding 2·05c. A large order for Savannah was in the market during the week, and more than one firm figured on it at that price and refused to shade down. Later the order was placed elsewhere at a lower figure. Prevailing quotations are: Spikes, 2·05c.; angle plates, 1·90c.; bolts and square nuts, 2·70c., and hex. nuts, 2·25c.: complete joint, 90c. for steel and 70c. for iron.

Structural Iron and Steel.—The specifications for new commercial structures about to be erected at every centre in the east shows such an increased use of structural iron and steel that expectation is lively, though actual transactions have been nothing unusual during the week. The demand for beams is, if anything, rather increasing, while the demand for plates and angles may be said to have fallen off in about the same degree. Neither change, however, is material. Quotations remain: Universal plates, 2·20; bridge plates, 2·15@2·20; angles, 2·15@2·20; tees, 2·55; beams, 3·10.

Tubes and Pipe.—The larger concerns are unusually busy, prices remain firm, and this market generally is in a very healthy condition. The schedule continues unchanged. We report ruling discounts on car lots, 47½ per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47½ on lap, galvanized; 40 on 1¾-inch boilers; 50 for 2 to 4-inch, and 52½ on larger than 4-inch; casing, all sizes, 50 per cent.

Merchant Steel.—Business is dull, and will be duller yet before reviving. Most of the mills are preparing for their annual stock taking, during which they shut down for a short time. Last week's quotations remain unchanged: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.; toe calks, 2¾c.; flat file, 4¾c.; mill file, 5¼c.; taper file, 7¼c.; first quality sheet, 10c.; second quality sheet, 8c.

Cleveland. June 12.

(From Our Special Correspondent.)

During the past week several large sales of iron ore have been made. Some of these were for eastern furnaces and some for furnaces on the Onio River. These sales and the increasing number of inquiries, coupled with the improving price of pig iron, have given a still firmer tone to the iron ore market.

Current lake freights for single trips are about the same, though it is the general opinion that the bottom has been reached. During the last ten days a few charters were made at 80c. from Escanaba. Now, however, Escanaba rates are firm at 85c., with a tendency to advance, owing to the increased rates on grain paid from Chicago.

Relative to lake freights, it may interest your readers to know something of the performances of our lake freight boats. The steel steamer "Pontiac," owned by the Cleveland Iron Mining Company, and built by the Cleveland Ship Building Company, has just brought down from Escanaba to Cleveland, 2,934 gross tons of iron ore. This equals 3,286 net tons, and is the largest cargo ever carried on the lakes. This cargo was loaded at Escanaba in about seven hours, and unloaded in a day and a half, actual working time, figuring 12 hours to each day.

The new steamboats of the Minnesota Steamship Company, "Manola" and "Mariska," are also making enviable records. The distance from Two Harbors to Cleveland is 820 miles. Owing to the shallow water in the Soo Canal, on account of which boats cannot load deeper than 14 feet 7 inches at present stage of water, they cannot carry as large cargoes as if they loaded at Escanaba, from which place boats are loading to a little over 16 feet.

The "Mariska," of this line, makes a trip regularly once a week, between Two Harbors, Lake Superior and Cleveland, and carries about 2,200 tons of ore with the present stage of water. These boats were built by the Globe Iron Works Company, of Cleveland. These are considered remarkable performances, and lake ship builders feel that they are building as fine freight boats as anywhere else in the world.

Hot Blast Foundry Irons.

Southern Coke	No. 1	14.75@ 15.00
" "	No. 2	14.00@ 14 50
" "	No. 3	13.50@ 13.75
Mahoning Valley, Lake ore mixture		17.50@ 18.50
Southern Charcoal	No. 1	17,00@ 17.50
" "	No. 2	16.50@ 17.00
Missouri "	No. 1	18.00@ 18.50
" "	No. 2	17.00@ 17.50

Forge Irons.

Neutral Coke	13.00@ 13.50
Cold Short	13.00@ 13.25
Mottled	12.00@ 12.50

Car Wheel and Malleable Irons.

Southern (standard brands)	22.00@ 23.00
" (other brands)	18.00@ 19.00
Lake Superior	22.50@ 23.00

Louisville. June 10.

(Special report by HALL BROS. & CO.)

There has been a decided improvement in the iron market since our last report, particularly as to sales and prices; buyers all seem anxious to cover their wants as far ahead as possible during this year and even beyond the year, while furnaces are loth to sell for long deliveries, except at advanced figures. There have been a good many sales made during this week, ranging from carloads to 400, 500, 1,000 and 3,000 ton lots. Prices during the week have varied to some extent; in the earlier part of the week there were orders entered lower than toward the middle and latter part. No. 1 Foundry sold at $12.30; No. 2 Foundry high as $12.10; Gray Forge, $10.75, while we learn of a 3,000 ton sale of Gray Forge on the basis of $10.50 cash at furnace; all the above figures are on the furnace basis. We have advice to-day from one of our furnace connections, naming prices on No. 1 and No. 2 Foundry of $13 and $12.50, respectively, cash at furnace. On the whole the future seems bright, and as the market has started upward, it will in all probability go up several dollars higher, if all appearances are true. We quote the slight advance over our last figures of 25 cents on coke irons; charcoal irons seem to be about the same as in our last report.

Hot Blast Foundry Irons.

Southern Coke	No. 1	$15.00@$15.25
" "	No. 2	14.25@ 14.75
" "	No. 3	13.75@ 14.00
Mahoning Valley, Lake ore mixture		17.75@ 18.75
Southern Charcoal	No. 1	17.00@ 17.50
" "	No. 2	16.50@ 17.00
Missouri "	No. 1	18.00@ 18.50
" "	No. 2	17.00@ 17.50

Forge Irons.

Neutral Coke	13.25@ 13.75
Cold Short	13.25@ 13.50
Mottled	12.25@ 12.75

Car Wheel and Malleable Irons.

Southern (standard orands)	22.00@ 23.00
" (other brands)	18.00@ 19.00
Lake Superior	22.50@ 23.00

Philadelphia. June 12.

(From our Special Correspondent.)

Pig Iron.—The iron trade is improving slightly throughout Eastern Pennsylvania. Numerous orders for crude iron come in every day, most of them for small lots for delivery during July and August. Good orders for forge irons for fall delivery have been received, and to-day there are negotiations pending for additional large lots, deliveries on which will extend, in some instances, to the end of the year; but the great bulk of buyers prefer to buy in a hand-to-mouth way. The opinion that higher prices will prevail is gaining ground, but there are no very apparent reasons for this faith. To-day's quotations are: $15.50 to $16 for forge, $17 for No. 2 foundry, $18 to $18.50 for standard No. 1, and $19 for special brands. The market is much steadier than it was 10 days ago. Some few forge iron makers refuse to renew quotations at $15.50, having made a number of good sales. No. 2 iron is very actively inquired for, but no large sales are reported as yet. Several good-sized orders for Bessemer have been booked at $20.50.

Billets.—A better feeling prevails, although it is difficult to effect large sales at the advance. As high as $33.50 has been asked for small lots, but a good deal less money has been taken for large orders.

Foreign Material.—No sales have been made in foreign material, and quotations remain where they have been for a week or two past.

Muck Bars.—Quotations are given to-day at $28.00@$28.50, with small sales, but a good deal of inquiry.

Merchant Iron.—A large amount of iron has been contracted for by the car builders and other large users. Prices range from 1.70@1.90. A good deal of refined iron is being sold from stores, in small lots. An active demand is expected for the next two or three weeks.

Nails.—Small lots of nails are selling at a little better prices this week than last, owing to the fact that a heavy distribution has been quietly going on among wholesalers.

Skelp Iron.—Skelp iron is in active demand at the drop; 1.70 and 1.90 are the ruling prices for grooved and sheared, respectively. A good deal of business is now in negotiation, and manufacturers expect to load up with business for the next three months.

Wrought Iron Pipes and Tubes.—Business is booming, especially for boiler tubes, and discounts are firm at the usual quotations.

Plate and Tank Iron.—A steady demand for bridge plate and tank, both steel and iron, is reported by manufacturers all over the State, and orders are coming in regularly. Prices are firm. Ship plates are quoted at 2.10 for iron and 2.25 for steel; fire-box, 3.75 to 4c.

Structural Iron.—All the mills are well supplied with work, and manufacturers say that the summer demand will result in an accumulation of orders which will keep their mills busy to the close of the year. Bridge plates are 2·10; angles, 2·20; beams and channels, 3·10.

Steel Rails.—A great deal of new business is promised for the near future. Quotations to-day, $31.50@$32. Several small buyers, who want one or two thousand tons, now regret that they did not accept the terms offered a few weeks ago. Makers are now quoting $31.50 in earnest as a bottom figure. The demand for light sections has been very active, and there are many buyers yet to be taken care of.

Old Rails.—The supply of old rails in this market has been exhausted. Quotations, $24.50@$25.50, delivered. A good many old rails would sell but the views of buyers are $24.

Scrap Iron.—No. 1 wrought scrap has sold at $22, and there is an upward tendency on account of the scarcity. Best machinery scrap is held at $17; there is very little here. Ordinary has sold as low as $15. Wrought turnings, $16.50. Old fish plates, $27.

Pittsburg. June 12.

(From our Special Correspondent.)

Raw Iron and Steel.—The market during the week shows but little change; holders continue firm at last week's prices, with no signs of weakening in order to effect sales. All things taken into consideration, prices have been well maintained. The first of July, the time for balancing books and closing up the first half year's business of 1890, will show if the balance is on the right side of the ledger.

The sales of raw iron in the past two weeks, compared with same time last year, show a large balance in favor of 1890, proving conclusively that Pittsburg continues to be the great iron and steel market of the country. A dispatch from a leading dealer in the East says: "The market remains firm, about the same condition as last week. There is a fair demand for everything on the list, and quoted rates are firmly maintained. Prospects are favorable for a more active market in the near future, but for the present orders are for small lots, immediate delivery, and at last week's prices."

The market has a stronger tendency and the general outlook is full of encouragement. In most articles there is a good healthy demand, at firm prices, with indications of further improvements not far off. In regard to iron and steel there is no talk of shading prices. Steel rails are active, the demand being large; a leading maker informed us he had to refuse a large order at satisfactory prices, not being able to fill the order in the time required, which speaks well for the rail trade.

Several furnaces in this vicinity are making their annual arrangements to go out of blast to make necessary repairs; how long a time will elapse before they will resume operations will depend on the state of trade; some of them have orders booked that will require them to continue in blast for some time yet. Home furnaces maintain a good position and are not accumulating stocks beyond the usual average; some indeed are said to be behind in their deliveries, and the next six weeks may be a more trying time for them, as the consumption of iron is interfered with by the extremely hot weather, while producers of pig iron are inclined to accept orders at current rates for June and July deliveries; beyond that they prefer to wait and take the chances of the market, hence it may be called a waiting market, with the appearances rather in favor of sellers.

Coal and Coke Smelted Lake Ore.

3,500 Tons Bessemer, July and August	19.80 cash.
3,000 Tons Bessemer, June, July and August	19.50 cash.
3,000 Tons Bessemer, June and July	19.50 cash.
2,000 Tons Bessemer at City furnace	19.25 cash.
2,000 Tons Bessemer	19.50 cash.
2,000 Tons Bessemer, June and July	19.75 cash.
1,500 Tons Bessemer	19.50 cash.
1,500 Tons Grey Forge	15.50 cash.
1,000 Tons Grey Forge	15.60 cash.
1,000 Tons Bessemer	19.00 cash.
1,000 Tons Grey Forge	15.70 cash.
1,000 Tons Grey Forge	16.00 cash.
500 Tons Grey Forge at furnace	15.00 cash.
500 Tons Grey Forge	15.25 cash.
500 Tons Grey Forge	15.25 cash.
300 Tons White Southern	14.50 cash.
200 Tons No. 2 Foundry	16.25 cash.
100 Tons No. 2 Foundry	16.50 cash.

Coke Native Ore.

1,000 Tons Grey Forge	15.25 cash.
125 Tons Silvery	17.50 cash.
75 Tons Silvery	17.00 cash.
50 Tons No. 1 Silvery	18.50 cash.
50 Tons No. 2 Foundry	16.50 cash.
50 Tons No. 2 Foundry all ore	17.50 cash.

Muck Bar.

2,000 Tons Neutral	28.75 cash.
2,000 Tons Neutral, August and Sept	29.75 cash.
1,500 Tons Neutral, July and August	29.25 cash.
1,000 Tons Neutral, July	28.75 cash.
500 Tons Neutral, July	29.00 cash.

Steel Slabs and Billets.

2,500 Tons Steel Billets July and August	31.50 cash.
1,500 Tons Billets	30.50 cash.
1,000 Tons Billets	29.75 cash.
750 Tons Steel Slabs	31.00 cash.

Skelp Iron.

850 Tons Sheared Iron	200	4 mo.
400 Tons Narrow Grooved	172½	4 mo.
500 Tons Wide Grooved	180	4 mo.

Steel Wire Rods.

600 Tons American Fives	40.75 cash.

Steel Bloom Ends.

1,500 Tons Bloom Ends	21.25 cash.
1,000 Tons Bloom Ends	21.50 cash.
1,000 Tons Bloom Ends, July	21.50 cash.

Ferro-Manganese.

300 Tons 80 per cent., July-Oct., Baltimore	75.00 cash.
300 Tons 80 per cent., Sept.-Oct.,'Baltimore	78.50 cash.
85 Tons 80 per cent., July, Baltimore	76.00 cash.

Spiegel.

300 Tons 10-12 per cent., f. o. b. New York	29.00 cash.
250 Tons 20 per cent., f. o. b. New York	30.75 cash.

Coke or Bituminous Pig—	
Foundry No. 1	$17.50@18.00
Foundry No. 2	16.25@16.50
Gray F. No. 3	15.50@16.00
" No. 4	15.00@15.25
White	14.50@15.00
Mottled	14.50@15.00
Silvery	18.75@19.75
Bessemer	19.00@19.75
Low Phos	27.00@27.50
Charcoal Pig—	
Foundry No. 1	23.50@24.50
Foundry No. 2	22.00@22.75
Cold-Blast	25.00@29.00
Warm-Blast	24.00@25.00
10 + 12% Spiegel f.o.b. N. Y.	29.00

20% Spiegel at New York	$30.75@
Muck-Bar	28.75@29.50
Steel Blooms	30.50@30.75
Steel Slabs	31.00@ 1.25
Steel Cr'p Ends	21.50@21.75
Steel Bl. Ends	21.00@21.50
Ferro-Man., 80% f.o.b. Balt.	76.00
Steel Billets	31.00@31.50
Old Iron Rails	25.00@25.50
Old Steel Rails	21.50@22.00
No. 1 W. Scrap	20.00@21.00
No. 2 W. Scrap	18.00@18.50
Steel Rails	34.00@35.00
" light sec	34.00@37.00
Bar Iron, nom	1.85@ 1.90
Iron Nails	1.90
Steel Nails	1.90
Wire Nails	2.30@ 2.35

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 13.

Heavy Chemicals.—The market for heavy chemicals shows but little change from the condition reported in this column last week. The end of the glass season having come it will be a few weeks before the trade assumes a brisker aspect.

Caustic Soda.—Late cables report an advance in the price of caustic. Quotations are, 60 per cent., 2·75c.; 70–74 per cent., 2·55@2·60c., 76–77 per cent., 2·60c.

Caustic soda ash is quiet at 1·37½@1·50c. Carbonated soda ash, 48 per cent., 1·40@1·50c.; 58 per cent., 1·40@1·45c. Sellers' prices are above buyers'; there is not much doing in this articles. Sal soda is unchanged at ·95@1c. on spot, and 1@1·05c. for forward shipment.

Bleaching powder.—For prime Liverpool brands on the spot quotations are 1·30@1.40c. Newcastle brauds are 1·25@1·30c., but it is probable that a lower price would be accepted.

Acids.—The acid market is in the condition that it has been for weeks past. A fair volume of business is being transacted, but prices show no inclination to advance. There is not an acid dealer who sees any reason why the price should go up. What manufacturers lose by the reduced cost to the consumer, they endeavor to make up by an increased amount of business.

It is reported that a gentleman interested in one of the Knickerbocker Chemical Company's elements has stated that the "combination has not worked satisfactorily, and some of the companies will withdraw from the trust July 1st." It is understood that the acetic acid pool will dissolve at the same date.

Acid, per 100 pounds in New York and vicinity: Acetic, $1.75@$2.25; muriatic, 18-degree, 80c.@$1.25; muriatic, 20-degree, 90c.@$1.50; muriatic, 22-degree, 90c.@$1.75; nitric, 36-degree, $2.75@$3.50; nitric, 40-degrees, $3 25@$4.4.50; nitric, 42 degree, $3.75@$4.75; sulphuric, 60-degree, 70@80c., and sulphuric, 66-degree, 85c.@$1.

Fertilizing Chemicals.—Only the amount of business generally transacted at this time of the year is being done. Prices remain nominally unchanged, as sales of any magnitude have been so few and far between that no change has been called for. We accordingly quote high grade dried blood $1.90@$1.95. For the low grade the price is $1.80@$1.85. Azotine, $1.90@$1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $19@$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18@$18.50. Fish scrap, $20.50@$21 per ton. f.o.b. factory. Sulphate of ammonia at $3.00@$3.10 per cwt. Concentrated tankage, $1.80@$1.85. Refuse, bone black, guaranteed 70 per cent. phosphate, $18@$18.50 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln-dried, $6.50@$7 per ton, both f. o. b. vessels at the mines. Freights by sail from Charleston to New York, $2.25@$2.50 per ton. Charleston rock, ground $11.50@$12, ex vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, $1.12½ per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, $2.37½ per 100 pounds.

Kainit.—There have been some sales to Southern consumers, but otherwise nothing new can be reported of this article, $9.50 for invoice weight and $9.75 for actual weight, are current quotations.

Muriate of Potash.—During the week 300 tons arrived at this port, 250 tons at Philadelphia and 150 tons at Baltimore, all of which went into consumption. Our quotations, $1.77½@$1.85, according to quantity, hold good at the present writing.

Nitrate of Soda.—As the diminution of supplies goes on there is less inclination to force orders at low prices. Sales at $1.67½ are hinted at, but present quotations are $1.70 on spot. Futures are strong.

Brimstone.—The market in brimstone is stronger, and buyers, realizing that there is but little prospect of an immediate decline in prices, are coming in more freely. Quotations are, for June-July shipments, best unmixed seconds, $21.25; thirds, $20.50.

NOTES OF THE WEEK.

A dispatch from Montreal, Canada, of the 9th inst., said that Arthur Gagnon had been appointed liquidator of the estate of the Maniconagan Fish Oil and Guano Company, and that New York capitalists were interested to the amount of $300,000. It was learned in this city that a petition for the winding up of the company was presented to the Canadian courts a month ago by a New York creditor, who had obtained judgment against the company for about $24,700 for money loaned, and that Mr. Gagnon was then appointed provisional liquidator. The company was chartered in July, 1888, with a capital stock of $200,000, the New York shareholders then being Colonel Rice, Hugh Peters, J. A. Peters, Colonel J. P. Wiswell, Eugene Jerome, Charles Campbell and W. H. Taylor. It is said that the New York people furnished all the money to run the concern. The company leased from the Canadian Government the Peninsula of Maniconagan to catch fish, seals, porpoises, etc. and to operate a factory to make oil, guano, etc. The company did not meet with success; very few fish, it is said, were caught, and it was decided to wind up the business.

The trade has been notified that the Standard Chemical Works will hereafter be known as the Grasselli Chemical Company. The change in the name is not accompanied by any change in the local management, which is popular in this market and fully conversant with the business. Mr. G. A. Schwarz remains in charge of the New York office.

Liverpool. June 4.

(Special Report by Messrs. J. P. Brunner & Co.)

The position of heavy chemicals at present is not very encouraging for manufacturers as there is little moving, and tendency generally is to lower prices. Soda ash.—Special brands are still inquired for, but without much actual business resulting. We quote to-day: Caustic ash, 1⅛d. to 1¼d. Carbonate ash 1¼ to 1⅜, according to brands. Soda crystals are in good demand at £3 to £3 2s. 6d. per ton, and makers being well sold, it is not easy to buy at the lower figure. Caustic soda.—The demond has fallen off, and with several second hand parcels offering for resale, prices are easier. At the same time makers are pretty independent at the moment, being well sold for early delivery. Nearest quotations to-day are as follows:

Sixty per cent., £7 2s. 6d. to £7 5s.; 70 per cent., £8 2s. 6d. to £8 5s.; 75 per cent., very scarce at £8 12s. 6d. to £8 15s.; 76 per cent., £9 10s. to £9 15s. Bleaching powder is very slow of sale and £5 to £5 2s. 6d. are nearest spot values; very few orders on the market. Chlorate of potash in small compass, and quotations range from 4¼d. to 4¾d. per pound, while there is little to be had at the lower figure. Bicarb soda in good demand and firm at £5 15s. per ton and upwards for 100 weight kegs, according to brand and quantity, with usual allowance for larger packages. Sulphate of ammonia quieter and prices rather a little off; sellers ask £11 5s. for good grey 24 per cent. f. o. b.; Liverpool, with buyers at 2s. 6d. per ton less.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, June 14.

Bricks.—The condition of the market for bricks is unchanged. The accumulation goes on and prices show a declining tendency, except in the case of pales, which are still in good demand at $2.50@$3. Haverstraws are $5@$6; Uprivers, $4@$5. There is very little call for Jerseys, which are nominally $3.75@$4.50 per M.

Lime.—As reported last week, shipments have been stopped and the output diminished. The Association took no action on the subject at Tuesday's meeting, and the cessation of arrivals will last, at least, another week. The strike among some of the building trades last week created an unsettled feeling, which is evident in the lassitude among dealers. The strike has been settled, and the trade will probably become brisker. Quotations are: For Rockland common, $1 per barrel; Rockland finishing, $1.20; St. John, common and finishing, 90c.@95c.; Glenns Falls, common and finishing, 85c.@$1.10.

IMPORTS AND EXPORTS OF METALS AT NEW YORK MAY 31 TO JUNE 7 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co	24	197
Hendricks Bros		50
La Marche's Sons, H		5
Lewisohn Bros		50
Meyer, G. A. & E.		9
Muller, Schall & Co		93
Total	24	404
Corres. date, 1889	28	179
Pig Lead.	Lbs.	Lbs.
Caswell, E. A		111
Hendricks Bros		50
Schultz & Co., A		98
G. W. Sheldon		149
Total		408
Corres. date, 1889	65	129
Tin.	Tons.	Tons.
Abbot, Jere, & Co.		50
Amer. Metal Co		2,125
Bidwell & French	365	585
Bruce & Cook		10
Carter, Hawley & Co	10	10
Cohen, H	20	20
Crooks & Co., R		75
Davol & Son		15
Hendricks Bros		26
Lehmaier, S., & Co.	9	67
Muller, Schall & Co.		520
Naylor & Co	66	841
Nissen, Geo		10
Phelps, Dodge & Co		2,350
Thomson, A. A. & Co		30
Thomson, D. & Co.	10	40
Townsend, & Co., J. R		30
Trotter & Co, N	25	75
Total	505	6,879
Corres. date, 1889	285	4,607
Tin Plates.	Boxes.	Boxes.
Bruce & Cook	7,233	49,010
Byrne & Son		1,000
Central Stamp. Co.	2,393	40,128
Coddington & Co	1,798	49,046
Cohn & Co	134	10,538
Con. Fruit Jar Co		120
Corbiere F. & Co	975	6,072
Cort & Co	7,245	68,194
Crooks & Co	5,545	19,428
De Milt & Co, H. R		868
Dickerson, V. D. & Co	19,193	162,122
Haberman, F		66
Herring, Chas. E		1,000
Iron Clad Mfg. Co		379
Lalance & G. M. Co.	352	8,116
Lazard Bros		1,048
Lehmaier, Schw'z & Co		200
Merchant & Co	1,138	10,497
Mersick & Co		4,041
Morewood & Co	2,000	35,220
Newell Bros		416
Payne, S. H. & Co		224
Pratt Mfg. Co	4,914	49,923
Phelps, Dodge & Co	61,281	328,868
Shepard & Co	604	1,823
Taylor, N. & G		234
Thomson & Co., A. A.	7,337	41,715
Warren, J. M		3,459
Wheeler & Co	150	10,944
Whittemore & Co.	1,342	10,749
Wolff & Reesing		2,077
Wright, Peter & Co		227
Total	126,634	918,662
Corres. date, 1889	62,136	1,066,626
Pig Iron.	Tons.	Tons.
Abbott & Co, Jere		100
Baldwin & Co., A	7	7
Crocker Bros	100	500
Dana & Co		150
Geisenheimer & Co		76
Irvin. R. I. & Co		100
Naylor & Co		150
Pierson & Co		30
Stetsson & Co., G. W.	250	1,575
Williamson, J. & Co.	200	1,050
Total	557	3,738
Corres. date, 1889	800	11,302
Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Baldwin Bros. & Co		2
Dana & Co	204	1,059
Downing, R. F. & Co		5
Martin & Co		80
Milne, A., & Co		18
Pope, Jas. E., Jr.		61
Roebling's Sons, J. A.	336	1,241
Wolff, & Co., R. H.		60
Total	540	2,526
Corres. date, 1889		46,491
Bar Iron.	Tons.	Tons.
Abbott & Co., Jere		489
Bacon & Co		554
Crocker Bros		77
Dickerson, Van Dusen & Co	6	6
Downing & Co		285
E. J. Jacobus	4	5
Fuller, Dana & Fitz		11
Holt, H. N		60
Lilienberg, N		385
Lundberg, G	290	390
Milne & Co		234
Muller, Schall & Co.		263
Page, Newell & Co.	144	1,284
Wilson, J. G		3
Total	444	4,046
Corres. date, 1889	102	3,098
Scrap Iron.	Tons.	Tons.
Muller, Schall & Co		18
Samper & Co., S.		186
Stevens, Corvin & Co		30
Ward, J. E. & Co.		392
Total		626
Corres. date, 1889		1,033
Steel and Iron Rods.	Tons.	Tons.
Abbott & Co	400	5,290
American S. Co	100	565
Bacon & Co		73
Carey & Moen	26	2.8
Cooper, Hewitt & Co		371
Dana & Co	86	373
Downing & Co		75
Galpin, S. A		1,066
Greely & Co. C. S.		35
Hazard Mfg. Co	20	179
Jacobus, E. Y		2
Lee, James & Co	201	1,149
Lillienberg, N	200	300
Lundberg, G		126
Milne & Co	22	355
Muller, Schall & Co.	50	557
Naylor & Co	254	3,469
Page, Newell & Co.	202	1,078
Roebling's Sons, J. A.	163	1,646
Schulze, P. R		1
Temple & Lockwood		6
Wiebusch & Ho		4
Wood & Niebuhr		25
Wolf & Co., R. H.	334	2,576
Total	2,058	19,149
Corres. date, 1889	220	23,704
Old Rails.	Tons.	Tons.
Bowring & Archibald	260	340
Frankfort. M		3,282
Henderson Bros		300
Hernsheim, E		350
Mosle Bros		123
Naylor & Co		1,083
Sawyer, Wallace & Co		610
Total	260	6,088
Corres. date, 1889		8,364
Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,725
Blakely & McLellan		1,684
Crocker Bros	3,243	11,737
Crooks & Co, R		106
Dana & Co	1,240	11,663
Foley, F		50
Geisenheimer & Co		228
Hernshime. L	525	11,797
Holt. H. N	200	200
Naylor & Co	66	9,196
Perkins, C, L		1,400
Sachs & Richmond		2
Whitiemore, H. & Co		25
Total	5,274	50,813
Corres. date, 1889	707	36,689
Iron Ore.	Tons.	Tons.
Baiz, Jacob		67
Bowring & Archibald	950	1,172
Earnshaw, A		3,193
Ennis, Andrew		438
Flores & Co., R. de		10,223
Johnson & Co., L		2,700
Total	950	17,793
Corres. date, 1889		7,508

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co., Jere	185,175	1,208,160
Amer. Met. Co., L	1,113,183	8 6,808
Barber & Co		13,750
Belmont, Aug. & Co		957,315
Burgass & Co		173,734
French, Edye & Co		135,374
Heidelbech, Sicheimer & Co		672,608
Seamen, S. H		66,950
Ward, J. E. & Co.		100,000
Wil'ms & Thune		112,004
Total	298,358	4,296,703
Corre. date, 1889		2,765,570
Copper Matte		
American Metal Co	134,489	2,005,351
Lewisohn Bros	107,244	1,257,412
Nichols, Geo. H		267,202
Paulsen, Wm		1,039,428
Wil'ms & Thune		2,848,706
Total	241,733	7,418,099
Corres date 1889		10,385,063

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied	Date and amount of last.			Dividends. Total paid.	Date and amount of last.		
1	Adams & L.	Colo.	$1,500,000	150,000	$10					$555 000	Jan.	1887	10
2	Alice, S. C	Mont	10,000,000	400,000	25	*	....	....	....	850,000	July	1890	06¼
3	Alma & Nel Wood C., G	Idah	300,000	30,000	10	*	....	....	....	60,000	Jan.	1 89	.50
4	American & Nettie, C.	Colo.	.....	300,000	....	.....	....	....	....	150,000	Nov.	1889	10
5	Amy & Silversmith, S.	Mont.	.....	341,419	....	.....	....	....	....	247,530	Aug.	1887	12½
6	Atlantic, C	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	620,000	Feb.	1890	1.50
7	Argenta, S	Nev..	10,000,000	100,000	100	35,000	July	1889	.10	40,000	Feb.	1890	.20
8	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*	....	....	....	440,000	Jun	1890	.10
9	Aurora, I	Mich	2,000,000	100,000	20	*	....	....	....	155,000	Oct.	1887	1.37½
10	Badger, S	Ont.	250,000	50,000	5	.....	....	....	....	37,500	Mar.	1890	.25
11	Bassick, G. S	Colo.	10,000,000	100,000	100	*	....	....	....	400,000	Mar.	1884	1.00
12	Belle Isle, S	Nev..	10,000,000	100,000	100	.....	....	....	....	300,00	Dec	1879	.25
13	Belcher, G. S	Nev..	10,400,000	104,000	100	2,028,000	Apl.	1890	.50	15,397,000	Apl.	1876	1.00
14	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	120,000	Dec.	1889	25	200,000	Jan.	1887	10
15	Bodie Con., G. S	Cal .	10,000 000	100 000	100	575,000	Nov	1889	25	1,602,572	Apl.	1885	.50
16	Boston & Mont, G	Mon.	2,500,000	250,000	10	*	....	....	....	520,000	Jun	1886	.15
17	Boston & Mont., C. &	Mon	2,500,000	100,000	25	*	....	....	....	1,300,000	May	1890	5.00
18	Breece, S	Colo	5,000,000	200,000	25	*	....	....	....	80,000	Feb.	1880	.01
19	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	.....	....	....	....	127,000	July	1887	.05
20	Bulwer, G	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175 000	Jan.	1884	.10
21	Bunker Hill & Sull	Idah.	3,000,000	300,000	10	*	....	....	....	150,000	Oct.	1883	06¾
22	Caledonia, G	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	160,000	Jun.	1890	.08
23	Calliope, S	Colo.	1,000,000	1	....	.....	....	....	....	90,000	Apl.	1890	.01
24	Calumet & Hecla, C	Mich	2,500,000	100,000	25	1,200,000	....	....	....	34,350,000	May	1890	5.00
25	Carbonate Hill, S. L.	Colo.	1,500,000	200,000	10	*	....	....	....	80,000	Apl.	1884	.05
26	Carlisle, G	N. M	1,000,000	200,000	5	.....	....	....	....	175,000	Dec.	1888	12½
27	Castle Creek, G	Idah.	100,000	100,000	1	.....	....	....	....	51,000	Oct..	1883	.03
28	Catalpa, S. L	Colo.	3,000,000	300,000	10	*	....	....	....	270,000	May.	1884	.10
29	Central, C	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,950,000	Feb.	1890	1.00
30	Chrysolite, S. L	Colo.	10,000,000	200,000	50	*	....	....	....	1,850,000	Dec.	1884	.25
31	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*	....	....	....	406,250	Aug.	1889	.05
32	Confidence, S. L	Nev..	.....	24,980	....	306,160	Mar.	1890	.75	199,680	Apl.	1889	1.00
33	Cons. Cal. & Va., G &	Nev.	21 600 000	216.000	100	108,000	Jan.	1885	.20	3,466,800	Apl.	1890	.25
34	Contention, S	Ariz.	12,500,000	250,000	50	....	....	....	....	2,587,500	Dec.	1884	.25
35	Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10	.....	....	....	....	210,000	Feb.	1889	.50
36	Crescent, S. L. G	Utah	15,000,000	600,000	25	.....	....	....	....	228,000	Oct.	1888	.03
37	Crown Point, G. S	Nev..	10 000,000	100,000	100	2,850,000	Sept	1889	.50	11,685,000	Jan.	1875	2.00
38	Daly, S. L	Utah	3,000,000	150,000	20	*	....	....	....	1,500 000	May	1890	.25
39	Deer Creek, S. G	Idah.	1 000,000	200,000	5	.....	....	....	....	20,000	Jun.	1889	.05
40	Deadwood-Terra, G	Dak..	5,000,000	200,000	25	*	....	....	....	11,000,000	Nov.	1887	.10
41	Derbec B. Grav., G. &	Cal..	10,000,000	100,000	100	90,000	Dec.	1881	.10	210 000	Oct.	1889	.10
42	Dunkin, S. L	Colo.	5,000,000	200 000	25	*	....	....	....	390,000	Oct.	1889	.05
43	Dunstone, G. S. L	Mont	1,000,000	200,000	5	*	....	....	....	6,000	Nov.	1888	.03
44	Eclipse	Colo.	100,000	100,000	1	.....	....	....	....	60,000	Nov.	1887	.10
45	Elkhorn, G. S	Mont	1,000,000	100,000	10	*	....	....	....	850,000	July	1887	.05
46	Empire Lt., G	Mont	500,000	100,000	5	50,000	July	1883	.50	70,500	Oct.	1887	.37½
47	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	550,000	Jun.	1889	.50	4,955,000	July	1888	.25
48	Evening Star, S. L	Colo.	500,000	50,000	10	*	....	....	....	1,45 .000	Dec.	1889	.25
49	Excelsior, G	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct..	1889	.25
50	Father de Smet, G	Dak..	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1883	.20
51	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun.	1871	....	960,000	Jan.	1889	2.00
52	Freeland, G. & C	Colo.	5,000,000	200,000	25	*	....	....	....	190,000	July	1886	.10
53	Garfield Lt., G. &	Nev.	500,000	100,000	5	.....	....	....	....	95,000	Apl.	1888	.12½
54	Gould & Curry, G. &	Nev.	10,800,000	108,000	100	4,465,500	Apl.	1890	.30	7,826,800	Oct.	1870	10.00
55	Grand Prize, S	Nev..	10,000,000	100,000	100	715,000	Nov.	1889	.30	525,000	Jan.	1890	.30
56	Granite, S. L	Idah.	500,000	500,000	....	*	....	....	....	28,400	Oct.	1889	.02
57	Granite Mountain, S	Mont	10,000,000	400,000	25	.....	....	....	....	8,400,000	Mar.	1890	.50
58	Green Mountain, G	Cal.	1,250,000	125,000	10	*	....	....	....	212,000	Nov.	1881	.07½
59	Hale & Norcross, G. &	Nev.	11,200,000	112.000	100	5,086,000	July	1887	.50	1,162,000	July	1888	.50
60	Hecla Con., S. & L. C.	Mont	1,500,000	30,000	50	.....	....	....	....	1,500,000	Apl.	1889	.50
61	Hel'n Mg & Red, G. & L.	Mont	3,315,000	663,000	5	*	....	....	....	197,97	July	1886	.06
62	Holmes, S	Nev..	10,000,000	100,000	100	325,000	Mar.	1890	.25	75,000	Apl.	1886	.25
63	Holyoke, G	Idah	200,000	200,000	1	.....	....	....	....	27,000	Feb.	1885	.10
64	Homestake, G	Dak	12,500,000	125,000	100	200,000	July	1878	1.00	4,543,750	May	1890	.10
65	Honorine, S. L	Utah	500,000	250,000	2	37,500	Apl.	1889	.05	125.000	Sept	1887	.05
66	Hope, S	Mont	1,000,000	100,000	10	*	....	....	....	233,252	Apl.	1888	.25
67	Horn-Silver, S. L	Utah	10.000.000	400.000	25	.....	....	....	....	4,100,000	Mar.	1890	.12½
68	Hubert, G	Colo.	1,000,000	1 mil'n	1	*	....	....	....	247.000	Dec.	1889	.00½
69	Idaho, G	Cal.	310,000	3,100	100	50,000	July	1883	.50	5,235,900	Apl.	1889	5.00
70	Ideal, S	Colo.	500,000	50,000	10	.....	....	....	....	15,000	Oct.	1886	.05
71	Illinois, S	N. M.	100,000	100,000	1	*	....	....	....	45,000	Apl.	1889	.20
72	Independence, S	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
73	Iron Hill, S	Dak.	2,500,000	250,000	10	134,000	July	1889	.03	156,250	Nov	1887	.07½
74	Iron-Silver, S. L	Colo.	10,000,000	600,000	20	*	....	....	....	2,500,000	Apl.	1889	.20
75	Jackson, G. &	Nev.	5,000,000	50,000	100	237,500	Nov	1880	.20	55,000	Jun	1889	.10
76	Jay Gould,	Mont	5,000,000	40,000	....	*	....	....	....	300,000	Apl.	1889	.04
77	Joculstita, G	Mex.	2,500,000	250,000	10	.....	....	....	....	1,200,000	Feb.	1886	.50
78	Jumbo, G	Colo.	2,000,000	200,000	10	.....	....	....	....	35.000	Oct.	1887	.02½
79	Kearsarge, C	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00	100,000	Jan	1890	2.00
80	Kentuck	Nev.	3,000,000	30,000	100	369,000	Dec.	1889	.30	1,350,000	Dec.	1886	.10
81	La Plata, S	Colo.	2,000,000	200,000	10	*	....	....	....	610,000	Sept	1882	.30
82	Leadville Cons., S. L.	Colo.	4,000,000	400,000	10	*	....	....	....	422,000	Apl.	1889	.05
83	Lexington, G	Mont	4,000,000	40,000	100	*	....	....	....	605,000	Jan.	1885	2.00
84	Little Chief, S. L	Colo.	10,000,00	200,000	50	*	....	....	....	810,000	Jan.	1890	.05
85	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*	....	....	....	1,050,000	Mch.	1889	.50
86	Martin White, S	Nev..	10,000,000	100,000	100	100,000	Feb.	1890	.25	140,000	Dec.	1886	.25
87	Mary Murphy, G. &	Colo.	350,000	3,500	100	*	....	....	....	175,000	May	1888	5.00
88	Matchless, S	Colo.	500,000	500,000	1	.....	....	....	....	15,000	Feb.	1890	.00½
89	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,825,000	Mar.	1876	....
90	Mono, G	Cal.	5,000,000	50,000	100	102,850	Nov.	1889	.25	12,500	Mar.	1886	....
91	Montana, Lt., G. &	Mont	3,300,000	660,000	5	*	....	....	....	2,465,129	Apl.	1890	.06
92	Morning Star, S. L	Colo.	1,000,000	100,000	10	.....	....	....	....	850,000	Dec.	1889	.20
93	Moulton, S. G	Mont	2,000,000	400,000	5	*	....	....	....	380,000	Dec.	1887	.07½
94	Mount Pleasant, G	Cal.	150,000	150,000	1	.....	....	....	....	150,000	Feb.	1887	.30
95	Mt. Diablo, S	Nev..	5,000,000	50,000	100	137,500	Jun.	1880	2.00	10,000	Oct	1889	.20
96	Napa, G	Cal.	700,000	100,000	7	.....	....	....	....	360,000	Apl.	1890	.10
97	Navajo, G. S	Nev..	10,000,000	100,000	100	185,000	Apl.	1888	.30	365,000	Apl.	1889	.10
98	New Guston, S	Colo.	500,000	100,000	5	.....	....	....	....	287,500	Dec.	1889	.87½
99	N. Hoover Hill, G. &	N. C.	300,000	120,000	2½	*	....	....	....	30,000	Dec.	1885	.06½
100	Northern Belle, S	Nev..	5,000,000	50,000	100	425,000	Jan.	1884	8.30	2,400,000	Apl.	1883	.50
101	North Belle Isle, S	Nev..	10,000,000	100,000	100	400,000	Sept	1889	.20	230,000	May	1888	.50
102	North Star, G	Cal..	1,000,000	100,000	10	.....	....	....	....	250,000	Dec.	1889	.50
103	Ontario, S. L	Utah	15,000,000	150,000	100	.....	....	....	....	11,000,000	May	1890	.50
104	Ophir, G. S	Nev..	10,000,000	100,000	100	4,159,440	May	1889	.50	1,995,800	July	1882	1.00
105	Original, S. C	Mont	1,500,000	60,000	25	*	....	....	....	123,000	July	1888	.05
106	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,322,500	Jun.	1890	1.00
107	Oxford, G	N. S.	125,000	125,000	1	.....	....	....	....	75,000	Sept	1888	.02
108	Paradise Valley, G. &	Nev	10,000,000	100,000	100	57,000	Apl.	1888	.15	150,000	Apl	1887	.10
109	Parrot, C	Mont	1,800,000	180,000	10	.....	....	....	....	588,000	May	1890	.10
110	Peacock, S. & C	N. M.	2,000,000	200,000	10	.....	....	....	....	60,000	Nov.	1886	....
111	Plumas Eureka, G	Cal..	1,405,250	140,625	10	.....	....	....	....	2,548,046	Oct.	1889	.37½
112	Plutus, G. S. C. L	Colo.	2,000,000	200,000	10	*	....	....	....	20,000	Feb.	1886	.10
113	Plymouth Con., G	Cal..	5,000,000	100,000	50	*	....	....	....	2.280.000	Feb.	1883	.40
114	Quicksilver, pref., Q	Cal..	4,350,000	43,000	100	.....	....	....	....	1,841,42	May	1890	1.50
115	" com., Q	Cal..	5,700,000	57,000	100	.....	....	....	....	643,867	July	1882	.40
116	Quincy C	Mich	1,000,000	40,000	25	300,000	Dec.	1862	....	5,370,000	Jan	1890	3.00
117	Republic, C	Mich.	5,000,000	100,000	50	400,000	Dec.	1889	.30	4,312,587	Jun	1887	1.25
118	Richmond, S. L	Nev..	1,350,000	54,000	25	*	....	....	....	99,785	Feb.	1889	.50
119	Ridge, C	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	585,000	Mar.	1888	.05
120	Robinson Con., S. L	Colo.	10,000,000	200,000	50	*	....	....	....	100,000	Dec.	1882	.50
121	Robert E. Lee, S. L	Colo.	10,000,000	500,000	20	.....	....	....	....	4,460,000	July	1889	3.00
122	Savage, S. & L	Nev..	11,200,000	112,000	100	6,542,000	July	1889	.50	7,500	Apl.	1883	.01
123	Shoshone, G	Idah.	150,000	150,000	....	.....	....	....	....	1,568,145	Apl.	1888	.12½
124	Sierra Buttes, G	Cal.	2,225 000	122,500	10	.....	....	....	....	102,000	Jan.	1871	1.00
125	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,250,000	Oct.	1889	.50	270,000	Apl.	1889	.10
126	Sierra Nevada, S. L.	Idaho	1,000,000	1	1	.....	....	....	....	40,000	May	1889	.02
127	Silver Cord, G. & L.	Colo.	4,500,000	450,000	10	.....	....	....	....	970,000	Apl	1890	.10
128	" King, S	Utah	10,000,000	100,000	100	50,000	Jan.	1890	.30	1,910,000	July	1887	.25
129	Silver Mo. of La. V	N. M.	500,000	500,000	1	.....	....	....	....	100,000	Apl.	1890	.05
130	Silverton, G. & L	Colo.	2,000,000	200,000	10	*	....	....	....	50,000	Jan	1881	.25
131	Small Hopes Cons.	Colo.	5,000,000	250,000	20	*	....	....	....	3,137,500	Jun.	1889	.10
132	Spring Valley, G	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	3,596,000	Jun.	1888	.05
133	Standard, G. &	Cal.	10.000.000	100,000	100	50,000	Feb.	1890	.25	155,000	Nov.	1881	.05
134	Stormont, S	Utah	500,000	500,000	1	*	....	....	....	844,000	Dec	1887	.20
135	St. Joseph L	Mo..	1,500,000	150,000	10	*	....	....	....	9,000	Apl.	1888	.06¼
136	Swansea, G	Colo	600,000	60,000	10	*	....	....	....	100,000	Nov	1881	.20
137	Tamarack, C	Mich	1,000,000	40,000	25	520,000	Apl.	1885	3.00	1,560,000	July	1890	3.00
138	Tip Top, S	Colo	10,000,000	100,000	100	250,000	Sept	1883	.25	1,250,000	Apl.	1884	.20
139	Tombstone, G. & L.	Ariz	12,500,000	500,000	25	*	....	....	....	97,500	Feb.	1886	2.50
140	United Verde, C	Ariz	3,000,000	300,000	10	*	....	....	....	37,500	Apl.	1888	.37½
141	Valencia, M	Ariz	150,000	150,000	100	.....	....	....	....	272,500	Oct.	1887	.10
142	Viola Lt., S. L	Idaho	750,0	150,000	5	*	....	....	....	1,275,000	July	1889	.05
143	Ward Cons., S. L	Colo	4,000,00	200,000	1	.....	....	....	....	20,000	Dec.	1871	1.00
144	Yankee Girl	Colo	2,500,0	250,000	1	.....	....	....	....	2,184,00	Aug	1889	.10
145	Yellow Jacket, S	Nev	2,000,0	20 000	100	5,508,000	Mar	1889	.50	3,300	Jun.	1889	.10
147	Webb City, L. Z	Mo.	55,0	11,000	5	.....	....	....	....	25,000	Oct.	1889	.25
148	Woodside	Utah	.....	.....	....	.....	....	....	....	175,000	.	1889	.10
149	Young America	Cal.	.....	.....	....	.....	....	....	....	.....	....	....	.....

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value.	Assessments. Total levied.	Date & am't of last.		
1	Agassis Cons., S. L	Colo.	$2,500,000	50,000	$50	*	....	....	....
2	Alleghany, S	Colo.	5,000,000	500,000	10	.....	....	....	....
3	Allouez, C	Mich	2,000,000	80,000	25	$737,000	Jan.	1890	.50
4	Alpha Con., G. S	Nev..	3,000,000	30,000	100	558,750	July	1888	.75
5	Alta, S	Nev..	10,000,000	100,000	100	2,248,800	Sept	1888	.50
6	Amador,	Cal..	400,000	200,000	2	*	....	....	....
7	American Flag, S	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.50
8	Amity, S	Colo.	250,000	250,000	1	.....	....	....	....
9	Angio-Montana, L	Mon.	600,000	120,000	5	.....	....	....	....
10	Astoria, G	Cal..	200,000	100,000	2	.....	....	....	....
11	Bacon Con., G. S	Nev..	5,000,000	200,000	25	*	....	....	....
12	Bechtel Con., G	Cal.	10,000,000	100,000	100	173,500	Jan.	1883	.10
13	Belmont, S	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
14	Best & Belcher, G. &	Nev.	10,080,000	100,800	100	2,180,590	Jan.	1890	.20
15	Big Pittsburg, S. L	Colo.	20,000,000	200,000	100	*	....	....	....
16	Bi-Metallic, S	Mon.	5,000,000	200,000	25	*	....	....	....
17	Black Oak, G	Cal.	3,000,000	300,000	10	*	....	....	....
18	Boston Con., G	Cal.	10,000,000	100,000	100	170,000	Nov	1888	.20
19	Bremen, S	N. M	5,000,00	500,000	10	*	....	....	....
20	Brownlow, S	Colo.	250,000	250,000	1	.....	....	....	....
21	Brunswick, G	Cal..	2,000 000	400,000	5	*	....	....	....
22	Bullion, G. S	Nev..	10,000,000	100,000	100	4,007,000	Aug.	1888	.50
23	Calaveras, G	Cal..	500,000	500,000	1	*	....	....	....
24	Calista	Wy	500,000	100,000	5	*	....	....	....
25	Carupano, G. S. C.	Ven.	200,000	100,000	2	*	....	....	....
26	Cashier, G. S	Colo.	500,000	250,000	2	*	....	....	....
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*	....	....	....
28	Cherokee, G	Cal.	1,500,000	150,000	10	.....	....	....	....
29	Chollar, S	Nev..	11,200,000	112,000	100	1,484,000	July	1889	.50
30	Cleveland, T	Dak.	1,000,000	500,000	2	*	....	....	....
31	Colchis	N. M	500,000	50,000	10	.....	....	....	....
32	Commonwealth, S	Nev.	10,000,000	100,000	100	170,000	Nov	1888	.50
33	Comstock, G. S	Nev..	10,000,000	100,000	100	30 000	Mar.	1887	.15
34	Con. Imperial, G. S	Nev.	5,000,000	50,000	100	1,802,500	Nov.	1889	.05
35	Con. Pacific, G	Cal..	6,000,000	60,000	100	192,000	Oct.	1889	.10
36	Cons. Silver, S	Mo..	2,500,000	250,000	10	.....	....	....	....
37	Crested, S. L	Colo.	3,000,000	300,000	10	.....	....	....	....
38	Crocker, S	Ariz.	10,000,000	100,000	100	135,000	Jan.	1890	.10
39	Crowell, G	N. C	500,000	500,000	1	*	....	....	....
40	Dahlonega, G	Ga..	250,000	250,000	1	*	....	....	....
41	Dandy, S	Colo.	5,000,000	500,000	10	.....	....	....	....
42	Decatur, S	Colo.	1,500,000	300,000	5	*	....	....	....
43	Deer Creek, S. L	Colo.	5,000,000	500,000	10	*	....	....	....
44	Denver Gold, G	Colo.	500,000	50,000	5	*	....	....	....
45	Durango, G	Colo.	500,000	500,000	1	.....	....	....	....
46	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886	1.00
47	El Cristo, G	U.S.C	1,000,000	500,000	2	*	....	....	....
48	El Dorado, G	Cal.	1,000,000	250,000	4	*	....	....	....
49	El Talento, G	U.S.C	1,000,000	500,000	2	*	....	....	....
50	Empire, S	Utah	10,000,000	100,000	100	*	....	....	....
51	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	.....	....	....	....
52	Exchequer	Nev.	10,000,000	100,000	100	515,000	Apl.	1889	.25
53	Found Treasure, G. S.	Nev..	10,000,000	100,000	100	30,530	Apl.	1889	2½
54	Gogebic L Syn., I	Wis.	5,000,000	200,000	25	*	....	....	....
55	Gold Cup, S	Colo.	500,000	500,000	1	*	....	....	....
56	Golden Era, S	Mon.	2 000,000	200,000	10	*	....	....	....
57	Gold Flower, G	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
58	Gold Rock, G	Cal.	1,000,000	500,000	2	*	....	....	....
59	Goodshaw, G	Cal..	10,000,000	100,000	100	*	....	....	....
60	Grand Belt, C	Tex.	12,000,000	120,000	100	.....	....	....	....
61	Grand Duke	Colo.	800,000	80,000	10	*	....	....	....
62	Great Remance, G	U.S.C	1,000,000	500,000	2	*	....	....	....
63	Gregory-Bobtail, G	Colo.	550,000	550,000	1	*	....	....	....
64	Gregory Con., G	Mon.	3,000,000	300,000	10	.....	....	....	....
65	Harlem M. & M. Co., G.	Cal..	1 000,000	200,000	5	.....	....	....	....
66	Head Cent. & Tr. & G	Aris.	10,000,000	100,000	100	.....	....	....	....
67	Hector, G	Cal..	1,500,000	300,000	5	45,000	Jan.	1889	.15
68	Highland, C	Mich	500,000	25,000	20	*	....	....	....
69	Hollywood	Cal.	200,000	100,000	2	.....	....	....	....
70	Hortense, S	Colo.	2,000,000	200,000	10	.....	....	....	....
71	Huron, C	Mich	1,000,000	40,000	25	280,000	May	1887	3.00
72	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10	*	....	....	....
73	Ironton, I	Wis.	1,000,000	40.000	25	.....	....	....	....
74	Iroquois, C	Mich	1,250,000	50,000	25	.....	....	....	....
75	J. D. Reymert	Aris.	10,000,000	100,000	100	.....	....	....	....
76	Julia Cons., G. S	Nev..	11,000,000	110,000	100	1,660,000	Jan.	1889	.10
77	Lacrosse, G	Colo.	1,000,000	100,000	10	*	....	....	....
78	Lee Basin, S. L	Colo.	5,000,000	500.000	10	*	....	....	....
79	Mayflower Gravel	Cal..	1,000,000	100,000	10	585,000	Mar.	1890	.50
80	May Mazeppa, S	Colo.	500,000	500,000	1	*	....	....	....
81	Medora, G	Dak.	250,000	250,000	1	.....	....	....	....
82	Mexican, G	Nev..	10,000,000	100,000	100	2,800,760	Dec.	1889	.25
83	Middle Bar G	Cal..	400,000	200,000	2	*	....	....	....
84	Mike & Starr, S. L	Colo.	1,000,000	200,000	5	*	....	....	....
85	Mollie Gibson	Colo.	2,000,000	100,000	2	*	....	....	....
86	Monitor, G	Colo.	100,000	100,000	1	*	....	....	....
87	Mutual Mg. & Sm.	W'sh	100,000	100,000	1	*	....	....	....
88	Native C	Mich	1,000,000	40,000	25	.....	....	....	....
89	Neath, G	Colo.	1,000,000	100,000	10	.....	....	....	....
90	Nevada Queen, S	Nev	10,000,000	100,000	100	250,000	Oct.	1889	2.5
91	New Germany, G	N. S.	100,000	100,000	1	*	....	....	....
92	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*	....	....	....
93	N. Commonw'th, S	Nev.	10,000,000	100,000	100	60,000	Apl.	1889	....
94	North Standard, G	Cal..	10,000,000	100,000	100	30,000	Nov	1889	....
95	Noonday, G. S	Cal..	600,000	60,000	10	208,000	Dec.	1881	.10
96	Oneida Chief, G	Cal

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10. H.	June 10. L.	June 11. H.	June 11. L.	June 12. H.	June 12. L.	June 13 H.	June 13 L.	SALES.
Adams, Colo	....	.....	....	....	.91	....	....	....	....	....	....	....	400
Alice, Mont	2.50	.....	2.60	2.55	2.70	2.65	....	....	2.6	2.55	2.75	....	3,800
Argenta, Nev	.13	.....	....	....	....	....	....	....	....	....	....	....	200
Aspen Mg, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Belcher	....	.....	....	....	....	....	3.45	....	....	....	....	....	100
Belle Isle, Nev	....	.....	....	....	.70	.60	.75	.65	.80	.75	....	....	1,500
Bodie Cons., Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Bos. & Mont., Mont	....	.....	....	....	....	....	....	....	....	....	....	....	....
Breece, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Bulwer, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Caledonia	....	.....	2 0	....	....	....	2.00	....	....	....	....	....	2,700
Chryso ite, Colo	.40	.....	..	....	.30	....	.40	....	....	....	....	....	400
Colorado Central	....	.....	....	....	....	....	....	....	....	....	....	....	....
Confidence, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va., Nev.	4.80	.....	4 50	....	4 75	....	4 75	4.70	....	....	....	....	575
Crown Point, Nev	....	.....	....	....	2 90	....	3.25	....	....	....	....	....	150
Deadwood, Dak	....	....	1.35	....	1.50	....	....	1 40	....	....	....	....	500
Dunkin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Con	....	.....	....	....	4.00	....	4 00	....	4 00	....	....	....	710
Excelsior, Cal	....	.....	, 4	....	....	....	....	....	....	....	....	....	20
Franklin, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	....
Freeland, Colo	.85	....	....	....	....	....	.75	....	.55	....	.62	.60	1,300
Gould & Curry, Nev	....	.....	....	....	....	....	2 90	....	....	....	....	....	50
Hale & Norcross, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Holyoke, Id	....	.....	....	....	....	....	....	....	....	....	....	....	....
Homestake, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	....
Horn-Silver, Ut	3.50	3.45	3 50	....	....	....	3 50	3 30	3 50	....	3.3	....	4,400
Iron Silver, Colo	....	.....	....	....	....	....	....	2.05	2.00	..	..	....	6 0
Leadville C., Colo	....	.....	.11	....	11	....	.12	....	....	....	....	....	5,800
Little Chief, Colo	.32	.31	.32	....	.33	.32	.32	....	....	....	....	....	5,9.0
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Moulton	....	....	.60	.. ..	....	....	....	....	....	....	....	....	30 0
Navajo, Nev	.40	.....	....	....	....	....	.50	....	....	....	....	....	600
North Belle Isle, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
North Star, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Ut	....	.....	45 00	....	44 50	....	....	....	....	....	45 25	44.00	220
Ophir, Nev	....	.....	....	....	4.90	....	....	....	....	....	....	....	100
Osceola, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	....
Plymouth, Cal	....	.....	....	....	....	....	....	....	....	....	8.13	8.00	20 0
Quicksilver, Pref	43.25	42 00	43 7	41.75	43.00	42.50	..	....	....	....	....	....	3,860
" Com	9.38	8 00	9.50	8 50	....	....	8.00	....	8.50	....	8.25	....	5,200
Quincy, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	....
Robinson Cons. Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Savage, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nevada, Nev	....	.....	2.90	....	2.75	....	3.4?	....	....	....	....	....	100
Silver Cord	....	.....	....	....	.50	.45	55	....	....	....	....	....	1,300
Silver King	....	.....	....	....	....	....	....	....	....	....	....	....	....
Silver Mg. of L. V	....	.....	....	....	....	....	....	....	....	....	.43	.42	1.000
Small Hopes, Colo	....	.....	....	....	....	....	.92	....	....	....	....	....	300
Standard, Cal	....	.....	.10	....	....	....	.12	.11	.13	.12	.12	....	2,850
Stormont, Utah	....	.....	....	....	....	....	....	....	.07	....	....	....	1,000
Yellow Jacket, Nev	....	.....	....	....	3 5	....	....	....	....	....	....	....	100

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 7. H.	June 7. L.	June 9 H.	June 9 L.	June 10 H.	June 10 L.	June 11 H.	June 11 L.	June 12 H.	June 12 L.	June 13 H.	June 13 L.	SA E.
Alloues	....	.....	....	....	....	....	7.25	....	....	....	....	....	100
Alta, Nev	1.35	....	....	....	....	....	1.50	....	....	....	....	....	650
Andes, Nev	....	....	1 00	.....	....	....	....	....	....	....	....	....	200
Amador, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
American Flag, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal	.01	....	.04	....	....	....	.04	....	....	....	....	....	3,3 0
Bechtel	....	.....	....	....	....	....	19	....	....	....	....	....	100
Best & Belcher, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Bonanza King, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Brunswick, Cal	1 25	1.20	1.25	1 00	1 05	1.00	1.05	1 00	1.05	1.00	1 00	....	7,926
Bullion, Nev	3 25	....	....	....	4.00	....	4.25	....	....	....	4 00	....	1,400
Butte & Bost, Mont	....	.....	....	....	....	....	....	....	....	....	....	....	....
Castle Creek, Id	....	.....	....	....	....	....	....	....	....	....	....	....	....
Cholla, Nev	....	.....	....	....	4.00	....	4 90	....	....	....	....	....	200
Col. & Beaver, Id	....	.....	....	....	....	....	.03	....	....	....	....	....	800
Commonwealth, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Comstock T., Nev	....	.....	....	....	.20	.18	....	....	.18	....	....	....	4,000
" bonds	....	.....	....	....	....	....	....	....	....	....	....	....	....
" scrip	....	....	....	....	....	....	....	....	....	....	.25	....	100
Con. Imperial, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Denver City, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, Rep of Col	1.15	....	1.20	1.15	1.20	1 15	1.00	....	....	....	1.05	....	1,500
Exchequer	....	.....	1 10	....	....	....	....	....	....	....	....	....	100
Gold Strip, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Julia, Nev	.45	....	.45	....	.45	....	.50	....	....	....	....	....	900
Kingst'n & Pemb'ke	....	.....	.70	.65	....	....	....	....	....	....	....	....	150
Kossuth, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Lee Basin, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Mexican Nev	3.50	....	....	....	3.60	....	3.85	....	....	....	....	....	30 0
Minn Iron Co., Mich	....	.....	....	....	87.50	86 00	....	....	....	....	87.00	....	410
Monitor	....	.....	....	....	....	....	....	....	....	....	....	....	....
Mutual Sm. & M. Co	1 60	....	1.60	....	1.60	....	1.60	....	....	....	1.60	....	1,200
Nevada Queen, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
N. Com'nw'th, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Occidental, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Oriental & Mil., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Overman, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ariz	1.45	1.35	1 50	1 38	1 50	1.45	1 45	1 40	1.45	1 41	1.50	1.40	13,6 0
Potosi, Nev	7.13	....	....	....	7 25	7.00	....	....	....	....	....	....	50
Rappahan'k, Va	.06	..	08	....	....	....	.05	.04	....	....	....	....	12,500
Ruby S. M. Co., bds.	....	..	....	....	102	....	....	....	....	....	102½	....	1,500
Santiag, U. S. C	....	.....	....	....	.50	.45	....	....	....	....	....	....	5 0
S. Sebastian	....	.....	....	....	..	....	.30	....	.25	....	....	....	20 0
Scorpion	.40	.....	....	....	....	....	....	....	....	....	....	....	30 0
Silver Queen	....	.....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev	....	.....	....	....	....	....	06	....	....	....	....	....	100
" Trust Cert	....	.....	....	....	....	....	....	....	....	....	....	....	....
Sutter Creek, Cal	....	.....	1.5	....	....	....	1 50	....	1.40	....	1.40	....	900
Tornado, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Utah, Nev	1 00	....	....	....	1.15	....	1 4	....	....	....	....	....	600
Wall St M. & M. Co	....	.....	....	....	....	....	....	....	....	....	....	....	....

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities ‡Assessment unpaid. Dividend shares sold, 41,315. Non-dividend shares sold, 52,530. Total, New York, 98,845.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	June 6.		June 7.		June 9.		June 10		June 11.		June 12		SALES.
Atlantic, Mich	22.50	22.13	23.00	22 25	23 75	22 88	24.25	23 63	24 00	23 5	24 00	..	1,880
Bodie, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Bonanza Developm't	1 05	1.00	1 00	....	1.05	1.00	1 10	1 05	1 10	.....	1 10	....	3,500
Bost. & Mont., Mont	64.88	62 50	67 50	6 .50	68.0	67.25	67.50	65 50	66 25	65 50	67.50	66 38	7,530
Breece, Colo	45	.....	....	....	....	....	....	....	....	....	....	....	200
Calumet & Hecla, Mich	3 3	312	315	311	22	312	320	318	3 6	315	3.7½	317	305
Catalpa, Colo	.40	.....	.35	....	.40	.38	40	....	.40	38	38	..	2,900
Central, Mich	....	.....	....	....	....	....	22 0	.....	24.50	24.0 2	.00	.....	560
Chrysolite, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo	60	.....	60	....	....	....	.65	....	....	.65	....	....	600
Eureka, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich	19.50	19.00	19 50	19 25	21.50	19.25	22 00	21.25	22 00	21.50	22 50	21.50	4,081
Freeland, Col	....	.....	....	....	....	....	....	....	....	....	....	....	....
Kearsarge	21.50	20 50	22.00	20.50	23.00	22 75	23 50	22.75	22 00	....	25 0	22.25	5,285
Little Chief, Colo	.34	.....	....	....	.34	....	.34	.....	.32	....	....	....	2,200
Little Pittsburg, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev	....	.. ..	....	....	....	....	....	....	....	....	....	....	....
Moulton	....	.....	....	....	.45	....	....	....	....	....	....	....	500
Napa, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	....
Osceola, Mich	40 00	39.00	42.00	40 00	45.00	42.00	47.00	45.00	45.50	44.00	47.0	45.50	11 045
Pewabic, Mich	....	.....	....	....	10,00	....	9 50	....	....	....	12.0	....	370
Quincy, Mich	110	108	110	....	110½	110	112	110	12	115	132	122	554
Ridge, Mich	....	.....	....	....	1 5	....	....	....	1.38	....	....	....	400
Sierra Nev., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Standard, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Utah	....	.....	....	....	....	....	....	....	05	....	....	....	1,000
Tamarack, Mich	198½	.....	1 99	198	200	198½	20 ½	197½	200	199½	2 1	200	578

NAME OF COMPANY.	June 6.		June 7.		June 9		June 10		June 11		June 12		SAL E.
Alloues, Mich	6 75	6 50	7 00	6 00	7.13	6.75	7 50	7 00	7.25	6 88	....	..	5,015
Arnold, Mich	1.05	1.00	1 05	....	1.40	1.20	1.45	1.40	1 50	1 40	1 60	1.48	9,550
Aztec, Mich	.23	.....	.. ..	....	.25	.....	.25	.....	....	....	.25	....	700
Bowman S., Nev	..	..	....	....	....	....	....	....	....	....	....	....	....
Butte & Bost., Mont	2 .5	.....	26.25	26 00	26 75	26.00	26 50	26 00	26.25	25 25	26 50	25 50	5,283
Centennial, Mich	37.00	.....	38.0	37 0	38 00	.....	38.00	37 50	38.00	37.50	40 00	38.00	2 582
Comstock, T	.....	....	....	....	....	....	....	....	....	....	....	....	....
Copper Falls Mg,	..	....	10.00	.....	....	....	....	....	....	....	....	....	200
Crescent, Colo	.12	....	....	....	....	....	....	....	....	....	....	....	100
Dana, Mich	....	.....	....	....	.33	.25	.35	....	.35	....	....	....	1,000
Don Enrique, N. M.	.23	.....	....	....	....	....	....	....	....	....	....	....	200
El Cristo, S. A	....	.....	....	....	....	....	....	....	1 20	....	....	....	300
Hanover, Mich	.30	.20	....	....	.38	.25	.40	.38	.53	.38	.55	.50	7,700
Humboldt, Mich	....	.....	....	....	....	....	....	....	3	....	....	....	200
Hungarian, Mich	....	.....	....	....	40	.....	40	.....	....	....	40	....	550
Huron, Mich	5 00	4.50	4 88	4 75	5 13	4.88	5.50	4 75	5.00	4 50	5.00	.....	8,675
Mesnard, Mich	....	.....	1 00	.90	....	....	....	....	....	....	1.00	....	250
National, Mich	3.35	....	2.90	....	3 50	3.00	3 50	....	....	....	3 25	....	820
Native, Mich	....	.....	....	....	.25	.....	....	....	25	....	....	....	2 600
Oriental & M., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Phoenix	1.40	.....	....	....	....	....	1 40	....	....	....	....	....	1,000
Pontiac	....	.....	.50	.....	....	....	....	....	....	....	....	....	50
Rockland	....	.....	....	....	....	....	....	....	....	....	....	....	....
Santa Fe, N. Mex	.95	....	.90	....	90	.88	.90	.80	.90	....	90	.80	11,775
Shoshone, Idaho	....	.....	....	....	....	....	....	....	....	....	....	....	....
South Side, Mich	....	.....	....	....	25	....	30	28	27	....	33	30	2 050
Star	....	.....	....	....	30	.25	34	33	33	31	....	....	1,400
Washington, Mich	....	.....	....	....	28	....	30	....	33	31	33	.30	2,70
Winthrop, Mich	....	.....	....	....	.15	....	30	....	....	....	....	....	600

Boston: Dividend shares sold, 43,488. Non-dividend shares sold, 65,305. Total Boston, 108,793.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10 H.	June 10 L.	June 11. H.	June 11. L.	June 12 H.	June 12 L.	June 13. H.	June 13. L.	Sales.
American Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal & Iron Co	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chic. & Ind. Coal RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	30	29½	31½	30	31½	31	31	30	31¼	30½	32¾	31¼	5,970
Col., C. & I	100	53⅜	53¼	54⅜	53⅞	54¼	53⅝	53⅛	53	53¾	52¾	53¾	53½	6,950
Consolidation Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	169½	.....	.....	.....	.....	.....	.....	.....	169½	.....	168½	168	960
D., L. & W. RR	50	146¼	145⅝	146⅝	145⅝	147⅛	146	146¾	145⅞	146	145⅝	146⅝	145½	24,875
Hocking Valley	100	.....	.....	25	24¾	25	24½	.....	.....	25	.....	25	.....	1.235
Hunt. & Broad Top	....	.....	.....	23½	23	23¾	23⅝	23¾	.....	23⅝	.....	.....	.....	1,148
Do. pref	.....	.....	49	.....	49½	49	.....	49	.....	49½	.....	.....	.....	632
Illinois Coal & Coke Co	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh C. & N	50	52⅜	.....	52⅜	52¼	52⅜	.....	.....	.....	52⅜	.....	.....	.....	355
Lehigh Valley RR	50	53½	53	53½	53	53½	.....	52¾	.....	52¾	52⅝	.....	.....	1,070
Lehigh & Wilkesb. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	.....	40
Mahoning Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coa	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	100	.....	.....	156½	.....	.....	.....	.....	.....	.....	.....	153	152½	217
New Central Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. R.R	100	124	.....	.....	.....	.....	.....	124¾	124½	126¾	124¾	126⅛	125½	2,310
N. Y. & S. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	.....	.....	.....	.....	.....	.....	8	7¾	.....	.....	110
Do. pref	100	.....	.....	33¼	33	.....	.....	.....	.....	.....	.....	32½	.....	300
N. Y. & Perry C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R.R	50	24	.....	24	.....	24	.....	23¾	.....	23½	.....	23⅜	.....	910
Do. pref	50	64¾	.....	65	64½	64⅛	.....	64	.....	63½	.....	.....	.....	800
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR	50	54	53⅛	54	53⅞	54	53⅞	53⅞	53⅛	53⅜	53⅜	.....	.....	4 666
*Ph. & R. RR	.....	47	46⅜	47½	46¾	47¾	47	47¼	46½	47¾	46⅝	47⅜	46⅛	**89,567
Sunday Creek Coal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	.....	51⅛	51	52	.....	52⅜	51⅛	52	51½	51¾	51	52¼	51½	2,000
Do. pref	.....	104	99	.....	.....	104	.....	.....	.....	101	.....	.....	.....	220
Westmoreland Coal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

**Sales in New York, 53,930; in Philadelphia, 35,637. Total sales, 144,275.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. June 6.	June 7	June 9.	June 10	June 11.	June 12.
Alpha	.....	.....	.....	.....	.....	.....
Alta	1.25	.....	1.80	1.40	1.40	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.60	.....	.70	.70	.70	.....
Best & Bel	3.40	3.60	3.75	3.80	3.70	.....
Bodie	.....	.65	.....	.70	.75	.....
Bulwer	.....	.....	.....	.20	.....	.....
Challar	4 20	4.25	4.30	4.80	4.85	.....
C'm'weal'h	3.70	.....	.....	3 70	3.75	.....
Con. C. & V	4.50	4 60	4.70	5.00	4.95	.....
Con. Pac	.....	.....	.....	.....	.....	.....
Crown Pt	2.60	2.70	3.10	3.00	3.25	.....
Eureka C	.....	.....	.....	4.00	.....	.....
Gould & C	2.25	2.30	2.75	2.85	2.75	.....
Grd. Prize	.....	.....	.....	.....	.....	.....
Hale & N	2.60	2.85	2.90	3.25	3.10	.....
M. White	.....	.....	.....	.....	.....	.....
Mexican	3.35	3.35	3.50	3.70	3.70	.....
Mono	.....	.....	.....	.....	.....	.....
Mt. Diablo	.....	.....	.....	.....	.45	.....
Navajo	.35	.....	.40	.40	.50	.....
Nev. Queen	.85	.80	.90	1.00	1.25	.....
N. Belle I	.....	.....	.....	1.85	1.0	.....
Occidental	.....	.....	.....	.....	.....	.....
Ophir	4.60	4.50	4.75	4.95	4.85	.....
Potosi	7.00	7.25	7.25	8.50	8.50	.....
Savage	2.20	2.25	2.40	2.70	2.60	.....
Sierra Nev	2.15	2.20	2.65	3.30	3.30	.....
Union Con.	2.85	2.85	3.15	3.25	3.30	.....
Utah	95	.95	1 05	1.20	1.25	.....
Yellow Jkt	2 95	3 05	3.25	3.45	3.30	.....

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	....	$ 10
Balt. & N. C	....	10
Big Vein Coal	....	....
Conrad Hill	....	10
Cons. Coal	26@26½	30
Diamond Tunnel	30	40
George's Crk. C	1.14	....
Lake Chrome	15	25
Maryland & Charlotte	....	....
North State	10	....
Silver Valley	50@53	58

Prices bid and asked, lowest and highest, during the week ending June 11.

Birmingham, Ala.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. R. Mill Co.	....	$60
*Alice Furnace	$103	....
Anna Howe G. Mg. Co	⅜	¾
Bessmer Land	$36¾@$37	$37¼@$37¾
Bir. Mg.& Mfg.	$85	$103@$105
Cahaba Coal Mg. Co	....	$70
Camille Gold Mg. Co	½	....
De Bardeleben C. & I. Co	....	$79
Decat. L. Imp.	$12	....
DecaturMin.L.	$22½	....
Ensley Land	$11¾	$11¾@$12
*Eureka	$200	$300
Florence L. & Mg. Co	$21	$24
Gadsen Land	$6¼	$6½@$6½
Hecia Coal Co.	$30	....
Hen. S. & M.Co	$85@$88	$91@$99
Mag-Ellen	$100	....
Mary Lee C. & R. Co	$20	....
Sheffield C. & I. Co	$61¼@$62	$64@$65
Sloss I. & S.	$50	$58
†Sloss I. & S.	$93¼	$78
††Sloss I. & S.	....	$95
Tuscaloose C. I. & L. Co	$24	$27
Tenn.C. & I. Co.	....	$55
" pref.	$104	$106
Woodstock I.Co.	....	$40½

Prices, highest and lowest, bid and asked during week ending June 9.

* Bonds. † First mortgage. †† Second mortgage.

Pittsburg, Pa.

COMPANY.	B.	A.	Closing
Allegheny Gas Co	$38.00	....	$38.00
Bridgewater Gas Co.	56.00@$57.00		57.00
Chartiers Val. Gas	41.00	43.50	43.50
Columbia Oil Co	....	....	....
Consolidated Gas Co.	....	....	....
East End E. Light Co.	60.00	....	60.00
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co	....	52.00	52.00
La Noria Mining	.18	.20	.19
Luster Mg. Co	16.63	19.00	17.25
Manuf'turers Gas Co.	10.00	16.00	16.00
Nat. Gas Co. of W. Va	....	....	....
N.Y.& Clev.Gas Coal.	30.50	32.25	30.50
Ohio Valley Gas	....	....	....
Mansfield C. & C. Co.	....	....	....
Pennsylvania Gas	14.00	16.00	14.00
People's Natural Gas.	28.00@32.00		32.00
People's N. G. & P. Co	15.75	16.13	16.00
Philadelphia Co	31.38	31.88	31.50
Pine Run Gas Co.	....	....	....
Pittsburg Gas	....	....	....
Silverton Mg. Co	....	....	....
South Side Gas	....	....	....
Tuna Oil Co	....	....	....
Union Gas	....	....	....
Washington Oil Co	89.00	110.00	110.00
W'house Brake Co	....	....	....
W'house A. B. Co	117.00	119.25	118.00
W'house E. Light	37.00	40.00	39.75
W'moreland & Camb.	....	....	....
Wheeling Gas	19.75	20.25	20.13
Yankee Girl Mg	2.00	3.00	3.00

* Actual selling price.

Prices bid, asked and closing during the week ending June 12.

Sales during the week ending June 12:

Philadelphia Co	10 shs.	@$31⅛
West. Air B. Co	25 "	@$117
West. Electric	75 "	$37½@$39⅞

St. Louis. June 11.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo	$ .91¼	$ .92½
American & Nettie	1.97½	2.00
Anderson	....	....
Aztec, N. Mex	....	.15
Bi-Metallic	28 25	....
Black Oak, Cal	....	.01
Black Spar	....	....
Bremen	....	....
Buckskin	.05½	.06
Carriboo, Idaho	....	....
Central Silver	.13¼	.14
Cleveland, Colo	....	....
Cleveland, Idaho	....	.25
Coeur d'Alene	....	.95
Dinero, Colo	....	....
Golden Era, Mont	....	....
Golden King	....	....
Gold Run	....	....
Golden West	.05½	....
Granite Mountain, Mont.	....	....
Hope, Mont	....	....
Ingram	....	.60
Iron Clad	....	....
Ivanhoe, Colo	.09	.10
I. X. L., Colo	....	....
Keystone	....	.02½
La Union	.09	.10
Little Albert	....	....
Little Giant	....	....
Major Budd, Mont	....	....
Mexican Imp., Mex	.17½	.20
Michael Breen	.90	.95
Montrose Placer, Colo.	.15	....
Mountain Key	.40	.45
Mountain Lion	....	....
Neath, Colo	.11	.13
Old Colony	....	....
Old Jesuit	....	....
Pat Murphy, Colo	.10½	.11
Pedro	.01	.02
Phillips, Colo	....	....
Pine Grove, Idaho	....	.02
Queen of the West, Idaho	....	....
Raspberry, Mont	....	....
San Francisco, Mont	....	.01
Silver Age, Colo	1.00	1.45
Silver Bell	....	....
Small Hopes, Colo	.83¾	....
Tourtelotte, Colo	.03	.03½
West Granite, Mont	1.10	1.17½
Wire Patch	.15	.16¼
Yuma, Ariz	....	....

Trust Stocks. June 13.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.	
Am. Cotton Oil. Tr. Repts	$31⅛@$31⅛
Cattle Trust	14 @ 16
Distillers' & Cattle Feeders'.	47 @ 48
Linseed Oil	50 @ 52
National Lead	21¼@ 21⅛
Natural Gas	@
Standard Oil	166 @169
Sugar Refineries	83⅝@ 83½

Sales at the New York Stock Exchange week ending June 13:

	Sales.	Price H.	Price L.
*American Cotton Oil	3,612	32¼	30½
National Lead	12,510	22¼	21½
Sugar	259,851	85⅝	78¾

* Trust receipts.

Foreign Quotations.

London.

COMPANY.	Highest.	Lowest.
Almada, Mex	1s. 9d.	1s. 3d
Amador, Cal	11s. 9d.	11s. 3d.
Appalachian, N. C	9d.	6d.
Canadian Phos, Canada.	£⅛	£⅛
Carlisle, N. Mex	3s 6d.	3s.
Colorado, Colo	£5-16	£3-16
Comstock, Utah	....	....
Condova	....	....
Cons. Esmeralda, Nev.	2s. 9d.	2s. 3d.
Denver Gold, Colo	1s.	6d.
Dickens Custer, Idaho.	1s. 6d.	1s.
East Arevalo, Idaho	2s.	1s.
Eberhardt, Nev	....	....
El Callao, Venezuela	£2⅝	£2⅜
Elmore, Idaho	2s. 3d.	1s. 9d.
Empire, Mont	1s. 3d.	9d.
Garfield, Nev	2s 9d.	2s. 3d.
Jay Hawk Mont	2s. 6d.	1s. 6d.
Josephine, Cal	4s.	2s.
Kohinoor, Colo	2s.3d.	1s. 9d.
La Luz, Mex	9d.	3d.
La Valera, Mexico	20s.	15s.
Montana Lt., Mont	£1 5-16	£1¾
New California, Colo	8s. 3d.	7s. 9d.
New Consolidated	9d.	3d.
New Eberhardt, Nev	£⅛	....
New Emma, S., Utah	£3-16	£1-16
New Flagstaff, Utah	1s. 9d.	1s. 3d.
Newfoundland, N. F	3s. 6d.	2d.
N. Gold Hill, N. C	1s.	6d.
New Guston, Colo	£4	£3¾
New Hoover Hill, N. C.	£⅛	....
Old Lout, Colo	£13-16	£11-16
Palmarejo, Mex	16s 6d.	15s. 6d.
Pinos Altos, Mex	£¾	£⅝
Pittsburg Cons., Nev.	4s.	3s.
Richmond Con., Nev	1⅝s.	1½s.
Ruby&Dunderberg, Nev	2s. 3d.	1s. 9d.
Sam Christan, N. C	1s. 3d.	9d.
Sierra Buttes, Cal	4s.	3s.
" Plumas Eur	£15-16	£13-16
Sonora, Mex	1s.	6d.
Stanly, N. C	....	....
United Mexican, Mex	£⅜	£¼
U. S. Placer, Colo	2s. 6d.	1s. 6d.
Viola Lt., Idaho	2s.	1s. 6d.

Highest and lowest prices during the week ending May 31.

Paris.

	Francs	Francs.
Belmez, Spain	742.50	742.50
Callao, Venez	61 25	61.25
Callao Bis, Venez	4.00	4.00
East Oregon, Ore	8.25	8 25
Forest Hill Divide, Cal	120.00	120.00
Golden River, Cal	350.00	350.00
" " parts	35.00	35.00
Lexington, Mont	121.25	121.25
" parts	3.00	3.00
Ouray, Colo	....	....
Rio Tinto, Spain	435.00	435 00
Tharsis, Spain	140 00	140.00

Highest and lowest prices during the week ending May 29.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs $1.75@$2.00
Muriatic, 18°, ℔ 100 lbs 1.00@1.50
Muriatic, 20°, ℔ 100 lbs 1.12½@1.75
Muriatic, 22° ℔ 100 lbs 1.37½@2.00
Nitric, 36°, ℔ 100 lbs 4.00@4.25
Nitric, 42°, ℔ 100 lbs 6.00@6.25
Oxalic, ℔ 100 lbs 6.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 80@1.25
Sulphuric, 66°, ℔ 100 lbs 1.00@1.75
Alkali—
Refined, 48 p. c @2¾
Refined, 58° 2¾@3
Alum—Lump, ℔ lb 1¾
Ground, ℔ lb 1¾@2
Lump. ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10
Aqua Ammonia—18°, ℔ lb 4¾
20°, ℔ lb 6
22°, ℔ lb 6@7
26°, ℔ lb 10@11
Ammonia—Sul., ℔ 100 lbs 3.15
Carb., per lb 7¼@8¼
Arsenic—White, powdered, ℔ lb 3¼@3½
Red. ℔ lb 5¾@6¾
White, at Plymouth, ℔ ton £12 2 6d.
Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£60
Asphaltum—F. ton 13.00
Prime Cuban, ℔ lb 4½@5½c
Hard Cuban, ℔ ton $28.00
Trinidad, refined, ℔ ton $30.00
Barytes—Sulph., Am. prime white 17@20
Sulph.,foreign,floated, p. ton 19½@21.50
Sulph., off color, p. ton 11.50@14.00
Carb., lump, f.o.b. L'pool, ton £6
No. 1, casks, Runcorn " " £4 10 0
No 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb 2@2½
Borax—Refined, ℔ lb. 9½@9⅝
Concentrated 7¾@8⅜
Refined at Liverpool, ℔ ton £29
Brimstone—*See Sulphur.*
Bromine—℔ lb 37@38
Chalk—℔ ton 1.75
Precipitated, ℔ lb 4¾@5
China Clay—English, ℔ ton 13,50@18.50
Southern, ℔ ton 13.50
Chrome Yellow—℔ lb 10@25
Cobalt—Oxide, ℔ lb 2.60@2.90
Copper—Sulph. English Wks, ton £20@£21
Copperas—Common, ℔ 100 lbs 70
Best, ℔ 100 lbs 75@1.00
Liverpool, ℔ ton, in casks £1 15s.
Cream of Tartar—Am. 99% 22½
Powdered, 99 p. c 23
Emery—Grain, ℔ lb 4½@5
Flour, ℔ lb 2¾@3½
Feldspar—Ground, ℔ ton 15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb 1¾@2
Gypsum—Calcined, ℔ bbl. 1.25@1.50
Iodine—Resublimed 2.75
Kainit—℔ ton $9.25@$9.75
Kaolin—*See China Clay.*
Lead—Red, ℔ lb 6¾@9
White, American, in oil, ℔ lb 6¾@7¼
White, English, ℔ lb 8½@8¾
Acetate, or sugar of, white 12@13
Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½
Litharge—Powdered, ℔ lb 6½@6¾
English flake, ℔ lb 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit .23@.28
Oxide, ground, per lb 2½@3½
Mercuric-Chloride—(*Corrosive Sublimate*), ℔ lb 70@72
Mineral Wool—℔ lb 2
Mica—In sheets according to size.
1st quality, ℔ lb .25@$6.00
Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
" J. F. L. S.," ℔ lb. ex dock 2½
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston. 5.75@7.00
Ground, ex vessel New York. 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00
Phosphorus—℔ lb .70@75
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb 5@7
Potassium—Cyanide, ℔ lb .39@40
Bromide, ℔ lb 33
Chlorate, ℔ lb 13@10
Carb. ℔ lb 4.70@5.54
Caustic, ℔ lb 7½@8
Iodide 2.65@2.70
Muriate, ℔ 100 lbs 1.77½@1.80
Nitrate, refined, ℔ lb 6@8
Bichromate, ℔ lb 10½@11
Sulphate, ℔ 100 lbs 2.30@2 35
Yellow Prussiate, ℔ lb 17½@18
Red Prussiate, ℔ lb 42@45
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb 1¾@2
Powdered, pure, ℔ lb 2¼@2½
Pyrites—Non-cupreous, p. units 10d
Quartz—Ground, ℔ ton. 14.00@16.00
Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb 6@10
Salt—Liverpool, ground ℔ sack 75@80
Turk's Island, ℔ bush .25@28
Salt Cake—℔ lb 60@62½
Saltpeter—Crude, ℔ lb. 5¼@5¾
Refined, ℔ lb 6@8
Soda Ash—Carb., 48 % 100 lb. 2¾
Caustic, 48 % 2¼@2½
Soda Caustic, 60% 3.25@3.35
" 70% 3.00
" 74-76% 2⅞
Sal, English, ℔ 100 lbs 1⅛@1⅜
Sal, American, ℔ 100 lbs .90
Nitrate. 100 lbs 1.70
Strontium—Nitrate ℔ lb. 9@9½
Sulphur—Roll, ℔ lb 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton. 19.00@19.2
Crude Brimstone, 3ds, ℔ ton. 18.50@18.7
Talc—Ground French, ℔ lb 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5
Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85
Vitriol—(Blue), Ordinary, ℔ lb. 5½@5¾
Extra, ℔ lb 7
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb 6@6½
Paris, Red Seal, ℔ lb. 6¾@7
* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb. $2.@$2.50
Sheet, per lb 2.50
Arsenic—(Metallic), per lb .40
Barium—(Metallic), per gram $4.00
Bismuth—(Metallic), per lb 2.75
Cadmium—(Metallic), per lb 1.00
Calcium—(Metallic), per gram 10.00
Cerium—(Metallic), per gram 7.50
Chromium—(Metallic), per gram 1.00
Cobalt—(Metallic), per lb 6.00
Didymium—(Metallic), per gram 9.00
Erbium—(Metallic), per gram 7.50
Gallium—(Metallic), per gram 140.00
Glucinum—(Metallic) per gram 12.00
Indium—(Metallic), per gram 9.00
Iridium—(Metallic), per oz 7.00
Lanthanum—(Metallic), per gr. 10.00
Lithium—(Metallic), per gram 10.00
Magnesium—Per lb 4.50
Manganese—Metallic, per lb 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per gm. .50
Niobium—(Metallic), per gram 5.00
Osmium—(Metallic), per oz 65.00
Palladium—(Metallic), per oz. 35.00
Platinum—(Metallic), per oz. 9.00
Potassium—Metallic, per lb 28.00
Rhodium—(Metallic), per gram, 5.00
Ruthenium—(Metallic), per gm. 5.50
Rubidium—(Metallic), per gram 2.00
Selenium—(Metallic), per oz. 1.80
Sodium—(Metallic) per lb. 2.50
Strontium—(Metallic), per gm. .60
Tantalum—(Metallic) per gram 9.00
Telurium—(Metallic) per lb. 5.00
Thallium—(Metallic) per gram .25
Titanium—(Metallic) per gram. 2.25
Thorium—(Metallic) per gram 17.00
Tungsten—(Metallic) per oz. 2.25
Uranium—(Metallic), per lb. 5.00
Vanadium—(Metallic), per gm. 22.00
Yttrium—(Metallic), per gram 9.00
Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3.50@3.75
Jerseys, ℔ 1,000 5.50@7.00
Up Rivers, ℔ 1000 6 75@7.00
Haverstraw seconds, ℔ 1000 6.50@7.00
Haverstraw firsts, ℔ 1,000 7.00@7.75
Fronts, nominal, ℔ 1000.
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore
Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu.ft. 45@1.25
Granite, Scotch ℔ cu. ft. 1.00@1.15
Cement—Rosendale, ℔ bbl .85@1.10
Portland, American, ℔ bbl. 2 15@2.45
Portland, foreign, ℔ bbl. 2.30@2.40
Portland, " special brands. 2.45@2.75
Roman, ℔ bbl. 2.65@2.85
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.00@8.25
Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black, roofing, ℔ 100 sq. ft. 4.25@5.50
Lime—Rockland, common ℔ bbl. 1.00
Rockland, finishing, ℔ bbl. 1.20
St. John, com. and finish, ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl .85@1.10
Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4.00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.